ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS

25c a Copy

NOV. 1938

McGraw-Hill Co. of Calif.

Every School Child
SHOULD HAVE A GOOD STUDY LIGHT
GOOD LIGHT GETS BETTER MARKS
PROTECT THEIR EYES FROM
Study-Strain
IT'S OK TO READ IN BED...
IF YOU HAVE PLENTY OF LIGHT
KEEP BRIGHT EYES SHINING
CORRECT LIGHT COSTS SO LITTLE
SOUTHERN CALIFORNIA EDISON COMPANY LTD.

Widening the Appliance Market

NEW AD SERIES SPEEDS LAMP SALES

Autumn's rapidly shortening days bring the subject of home lighting to the fore and the current Edison newspaper campaign drives home the arguments for adequate lighting throughout every room in the house. Use this strong backing to feature approved lighting units this Fall. It's a field offering almost unlimited possibilities.

11-38

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), November, 1938, Vol. 81, No. 5. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
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The All-Industry Magazine of Progress

ELECTRICAL WEST

MEMBER AUDIT BUREAU OF CIRCULATIONS

ESTABLISHED 1887 AND INCORPORATING THE "ELECTRICAL JOURNAL," "JOURNAL OF ELECTRICITY, POWER & GAS" AND "JOURNAL OF ELECTRICITY"

ABP

McGRAW-HILL COMPANY OF CALIFORNIA
883 Mission Street, San Francisco

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Lighting The West

WE (meaning ELECTRICAL WEST) were pretty rudely shocked the other day. For a long time, you see, we'd been saying that our magazine contained more stories and pictures about lighting than any other electrical publication. Then somebody said, "Prove it."

So we started out to prove it. We dug out our bound volumes and found that in 1936 ELECTRICAL WEST carried 44 pages of lighting material. In 1937 it carried 47 pages. And in the first nine months of 1938 it carried 49 pages.

These looked like substantial figures. We said, "Shucks, no one can lick us."

Then we took out Magazine A. In 1936 Magazine A carried 31 pages of lighting; in 1937, 67 pages; and in the first nine months of 1938, 27 pages. That "67" looked bad.

Magazine B, however, spoiled our dispositions. Magazine B carried 70 pages of lighting in 1936; 63 in 1937, and 65 in the first nine months of 1938.

We bowed our heads in shame. We, who had been campaigning for better lighting for years and years, were beaten at our own game.

Came finally a ray of sunshine. Someone piped from the depths: "But look. Magazine A is strictly a contractors' journal. We cover the whole industry. If they beat us again this year, they ought to."

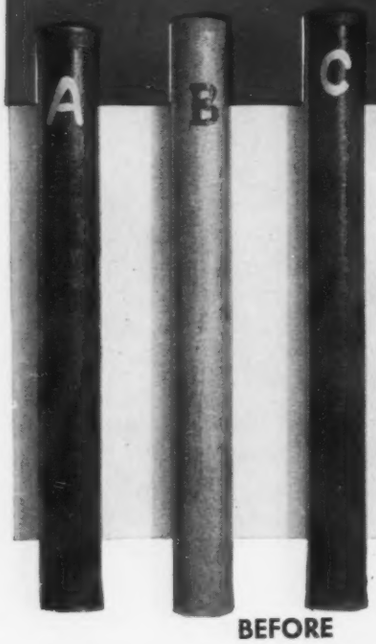
"And Magazine B," said someone else, "is a weekly. We're a monthly. And yet their 33-month total is only 58 pages better than ours."

The third speaker uttered the really profound truth: "O.K., boys. But remember: ELECTRICAL WEST is a Western magazine, catering only to Western electrical men, describing nothing but Western electrical feats. ELECTRICAL WEST is the only magazine published that can give Western electrical men — especially contractors —the specific Western information they need to make more money in the world's greatest electrical market—the West."

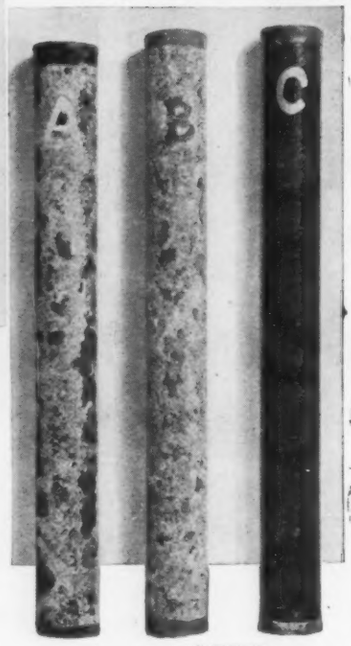
WALKERIZED

DUALCOTE

will help you solve your salt water problems.



BEFORE



AFTER

Here is the Proof

Three high grade conduits were bathed for the same length of time in a fine spray of salt water.

Samples A & B are widely accepted galvanized conduits. Sample C is Walkerized Dualcote.

The unique outer coating, that defies acids and alkalis, also protects this new conduit from salt corrosion.

Dualcote's double protection for special installations guarantees safer and longer service for all jobs.

There is no premium for this extra protection.

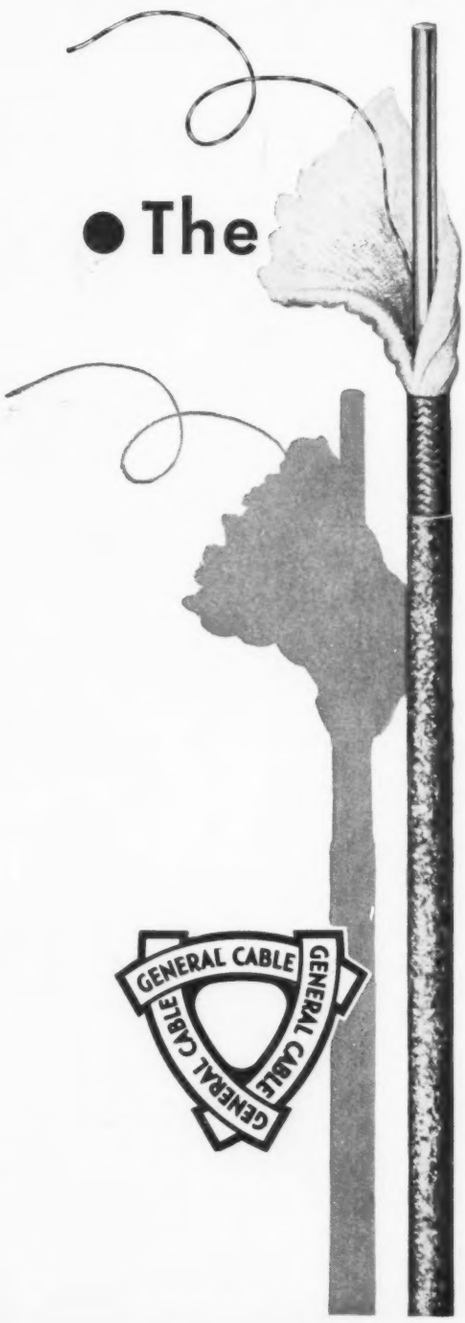
Ask Our Nearest Representative for full details

GARNETT YOUNG & CO.
910 E. Third St., Los Angeles
GARNETT YOUNG & CO.
390 Fourth St., San Francisco
GARNETT YOUNG & CO.
503 Polson Bldg.
Seattle

WALKER of Conshohocken, Pa.

PEERLESS* URC

WEATHERPROOF



• The Wire that does not Festoon

1 Unspun cotton fibers prevent migration, retain saturant, and prolong life of complete weatherproof covering.

2 Old lines in service for 20 years and more, in sun and salt air of seaboard areas, show no exposed copper.

3 Available in double and triple braid equivalents.

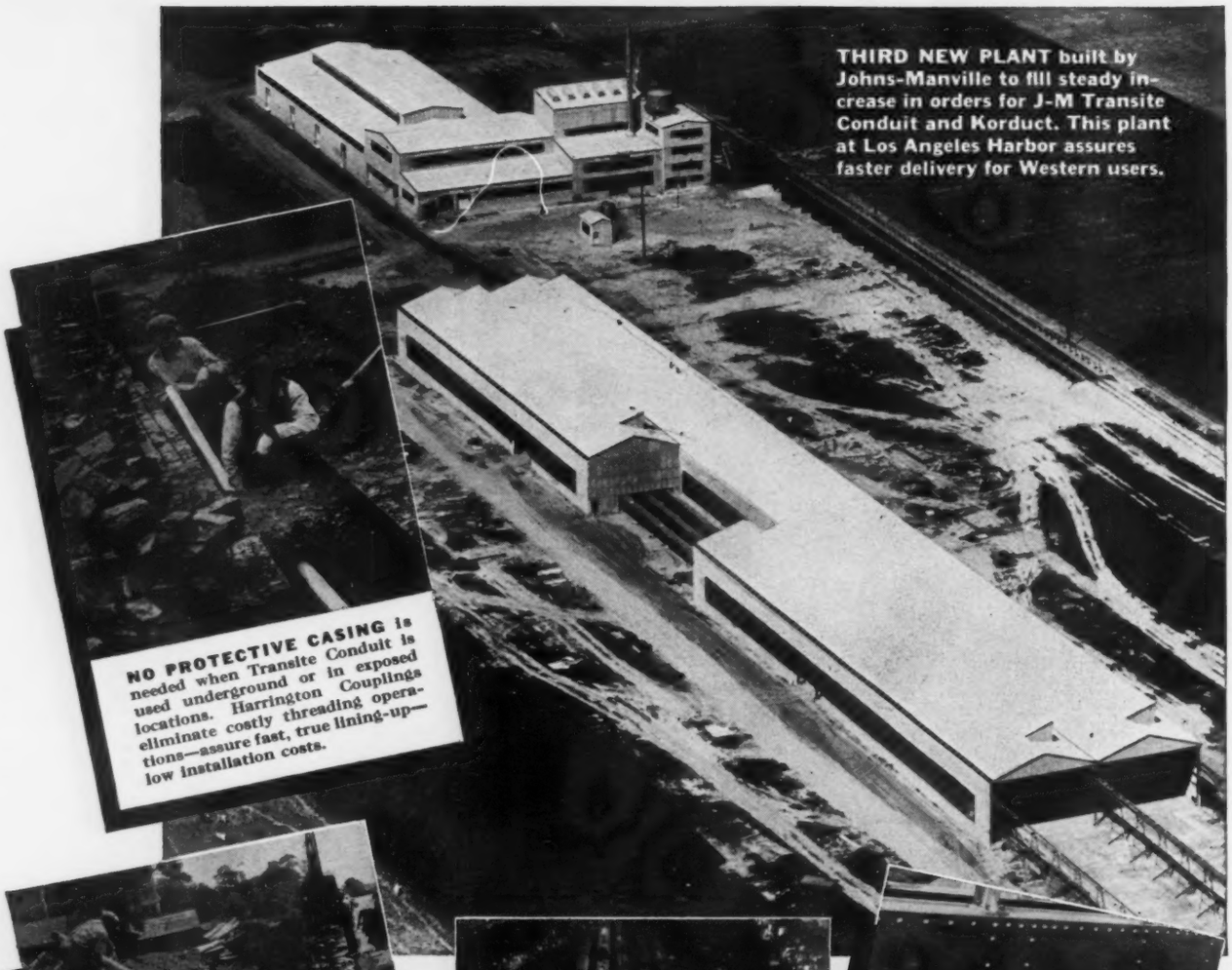
4 Test and performance data on request.

*Trade-Mark

GENERAL CABLE CORPORATION

Sales Offices: ATLANTA • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DETROIT • LOS ANGELES
NEW YORK • PHILADELPHIA • PITTSBURGH • ROME (N.Y.) • ST. LOUIS • SAN FRANCISCO • SEATTLE • WASHINGTON (D.C.)

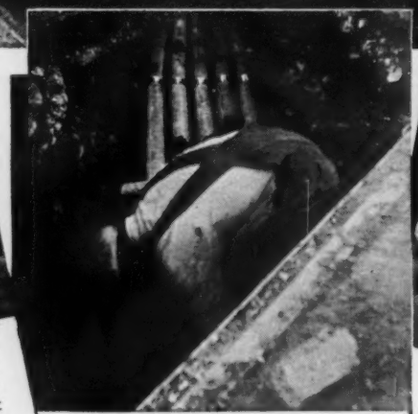
NOW—A THIRD NEW



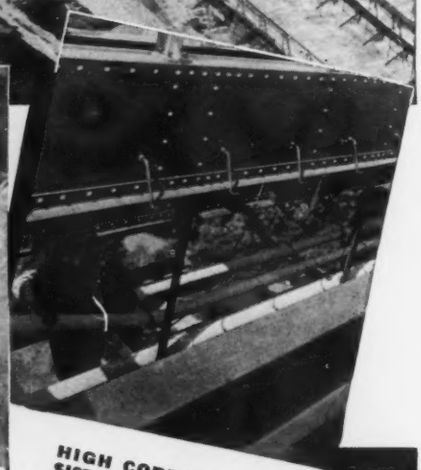
THIRD NEW PLANT built by Johns-Manville to fill steady increase in orders for J-M Transite Conduit and Korduct. This plant at Los Angeles Harbor assures faster delivery for Western users.

NO PROTECTIVE CASING is needed when Transite Conduit is used underground or in exposed locations. Harrington Couplings eliminate costly threading operations—assure fast, true lining-up—low installation costs.

LOWER MATERIAL COST makes Transite Korduct ideal for jobs where "concreting-in" is specified. Thinner walled than Transite Conduit, but otherwise identical, it provides the same advantages of incombustibility, low-cost installation, long life, minimum maintenance.



SMOOTH BORE permits long cable pulls without damage to sheathing. Joints are tight and snug—projection-free. Cables can be removed easily and quickly from Transite Ducts even after the line has been in service for years.



HIGH CORROSION RESISTANCE of Transite Ducts is due to their asbestos-cement composition. Non-metallic and inorganic, they are immune to rust, decay and electrolysis, exceptionally resistant to corrosion.

TRANSITE DUCT PLANT..

at LOS ANGELES HARBOR

to meet the rapidly growing demand for these durable, asbestos-cement cableways

HIGHLY WEATHER-RESISTANT. Transite Conduit is the ideal material for outdoor lines. Wherever used, these modern cable raceways provide lasting, economical distribution systems.

INCOMBUSTIBILITY is one of the outstanding advantages of Transite Ducts. They offer unusual resistance to heat, flame and arc—cannot generate fumes or gases when burnouts occur.

IT IS significant that even with two huge plants working at peak production, still another is needed to supply the ever-increasing demand for Transite Ducts. It proves that men interested in low-cost electrical distribution appreciate Transite's outstanding advantages—economy of installation—virtual freedom from maintenance—permanently low distribution costs.

Made of asbestos and cement, Transite Ducts are strong and durable—light in weight—supplied in long lengths that are easily, economically assembled. Transite Conduit has such great resistance to sustained loads it requires no concrete envelope when used underground or in exposed locations. Where "concreting-in" is specified, Transite Korduct, thinner walled and lower priced, saves considerably on material costs.

And J-M Transite Ducts offer many other advantages as well. Both the Conduit and Korduct are absolutely incombustible, highly resistant to weather and all forms of corrosion. The smooth bore permits long cable pulls without damage to sheathing—and it stays smooth indefinitely—cables can be easily replaced even after years of service.

Why not get all the details on these modern asbestos-cement ducts? You'll be interested in the many opportunities they offer to save on distribution costs. Write for Engineering Brochure D. S. 410. Address Johns-Manville at San Francisco, Los Angeles or Seattle.

JOHNS-MANVILLE JM PRODUCTS

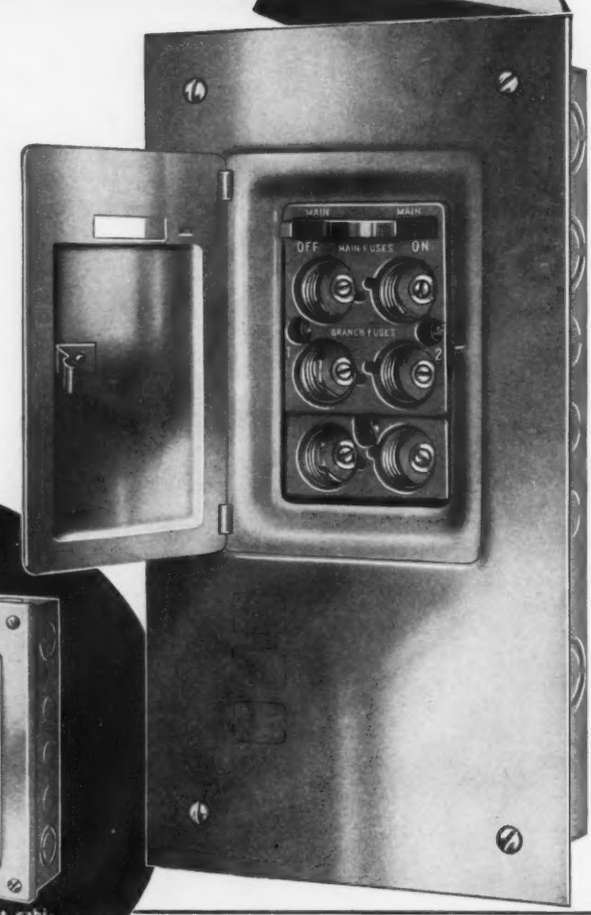
Johns-Manville

TRANSITE CONDUIT

for use underground without concrete, and for exposed locations

TRANSITE KORDUCT for installation in concrete

...Announcing A NEW LINE OF COLT-NOARK FUSELESS MAIN SWITCHES



- ✶ designed to cut installation costs
- ✶ providing extra space for branch circuits
- ✶ two cabinet sizes . . . for flush or surface mounting

A new line to boost your switch profits

Cat. No. 32N3, showing short cabinet. At right is Cat. No. 35N6F in long cabinet, with space for Transformer and Despard Switch.

Note these Features

1. Maximum of six branch circuits.
2. Permitted by National Electrical Code and listed by Underwriters' Laboratories.
3. Front operated Rotor Disc switch.
4. With or without provision for both transformer and Despard Type switches.
5. Complete interior units easily removed from cabinets to facilitate wiring.
6. Flush and Surface type cabinets.
7. Plaster adjustments for flush type cabinets.

Fuseless Main Switches with up to six branch circuits are now permitted by the National Electrical Code . . . and here is a brand new Colt-Noark line of Fuseless Main Switches that come within these specifications. 30 Ampere, 125-250 Volts, with Solid Neutral. They are typical Colt-Noark units . . . compact, rugged, easily installed, designed to provide maximum safety and long life. Note the features at the right . . . then order your stock and get your share of this new business.

Detailed information is yours for the asking. Also send for a copy of our latest catalog 60-S.

100 Years of Manufacturing Experience is back of every Colt Built Product

COLT-NOARK

SWITCHES INDUSTRIAL CONTROL EQUIPMENT FUSES

Boston
New York
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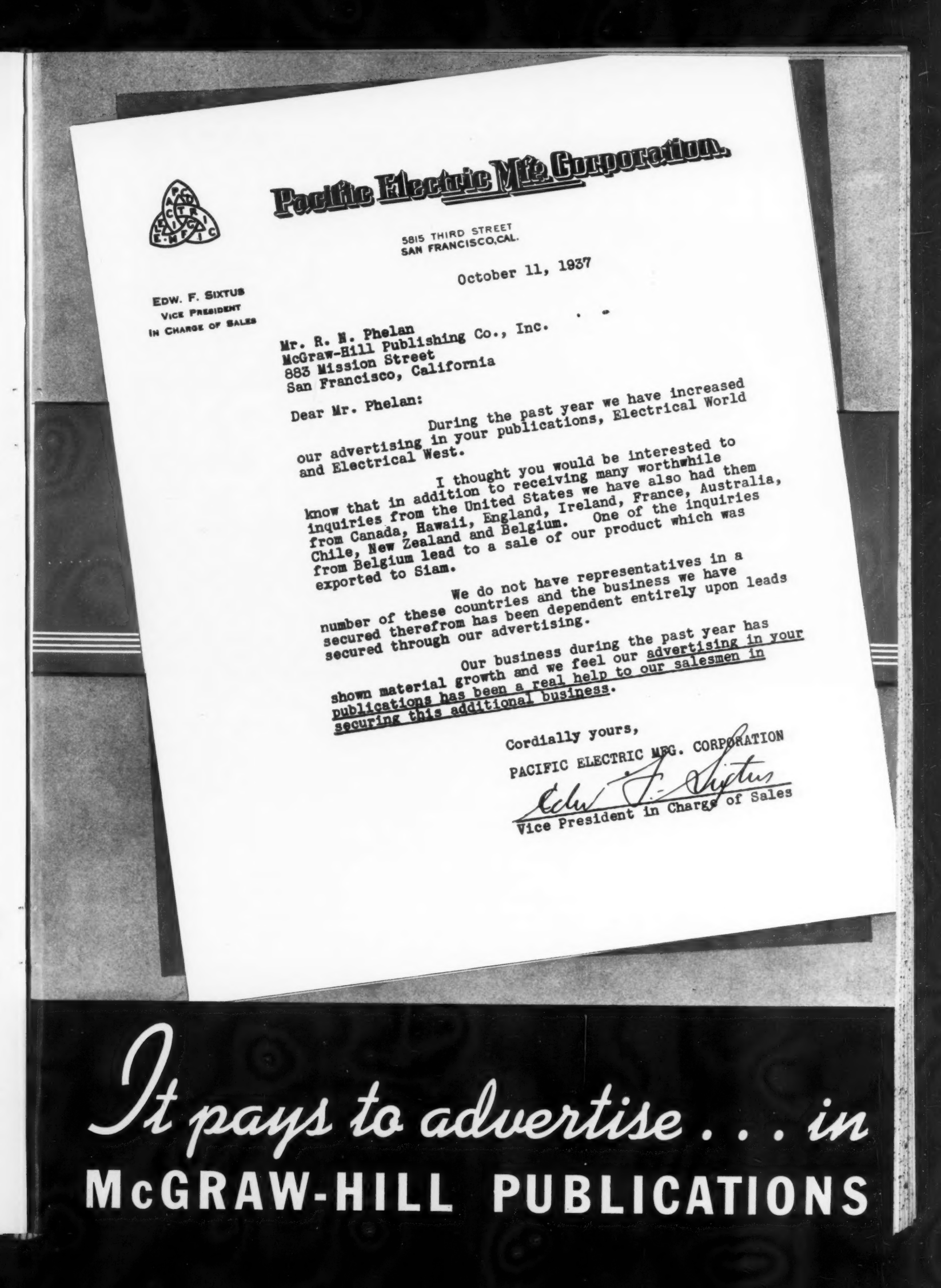


Pacific Electric Mfg. Corporation.

5815 THIRD STREET
SAN FRANCISCO, CAL.

EDW. F. SIXTUS
VICE PRESIDENT
IN CHARGE OF SALES

October 11, 1937

Mr. R. M. Phelan
McGraw-Hill Publishing Co., Inc.
883 Mission Street
San Francisco, California

Dear Mr. Phelan:

During the past year we have increased our advertising in your publications, Electrical World and Electrical West.

I thought you would be interested to know that in addition to receiving many worthwhile inquiries from the United States we have also had them from Canada, Hawaii, England, Ireland, France, Australia, Chile, New Zealand and Belgium. One of the inquiries from Belgium lead to a sale of our product which was exported to Siam.

We do not have representatives in a number of these countries and the business we have secured therefrom has been dependent entirely upon leads secured through our advertising.

Our business during the past year has shown material growth and we feel our advertising in your publications has been a real help to our salesmen in securing this additional business.

Cordially yours,

PACIFIC ELECTRIC MFG. CORPORATION

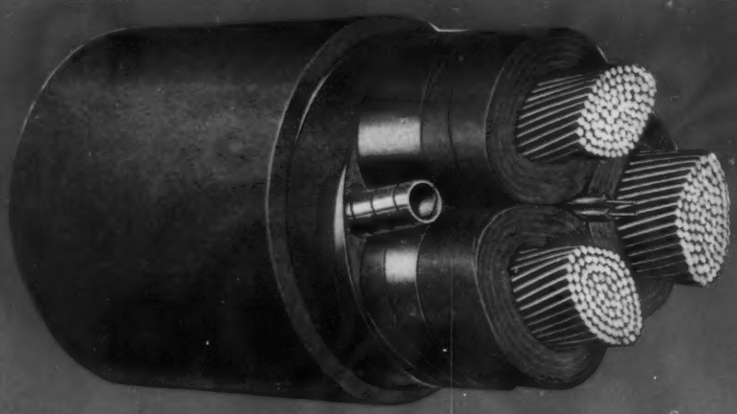
Edw. F. Sixtus

Vice President in Charge of Sales

It pays to advertise . . . in

McGRAW-HILL PUBLICATIONS

OKONITE-CALLENDER



OIL-FILLED

Paper-Insulated Cables

Okonite-Callender oil-filled cable provides an economical means of solving many problems that arise in operating high-voltage, underground systems.

Among the important advantages of oil-filled cable are:

Smaller outside diameters
Greater insulation stability
Greater allowable current carrying capacity

It is recommended that oil-filled cable be given consideration in plant problems involving high-voltage, underground cables. We offer an active, practical engineering service for assistance in such studies. Our bulletin on oil-filled, paper insulated cables will be mailed upon request.

1938 Marks Our 60th Year of Service

THE OKONITE COMPANY

Founded 1878

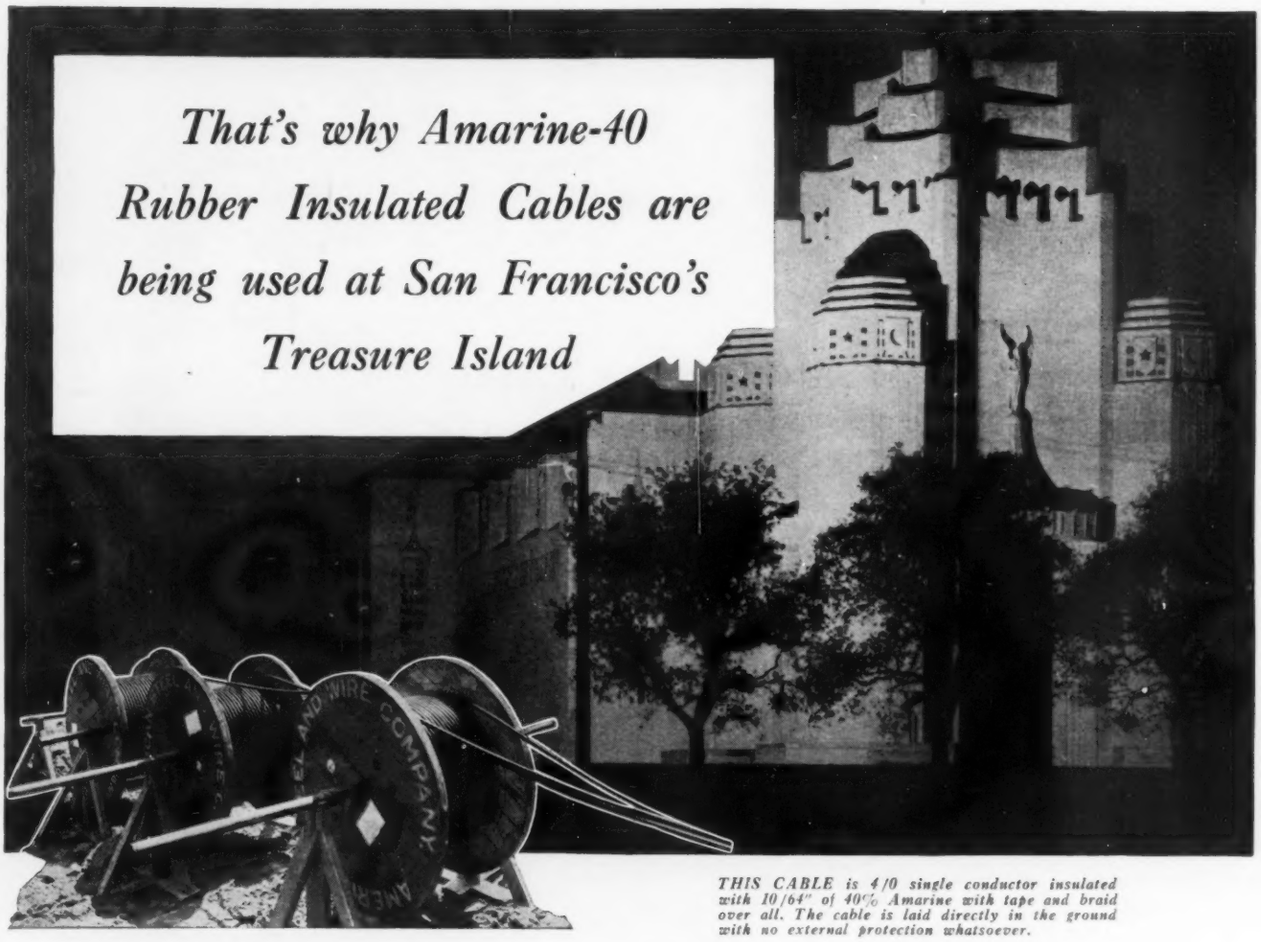
EXECUTIVE OFFICE:
HAZARD INSULATED WIRE WORKS DIVISION
New York Boston Seattle Buffalo
Philadelphia Los Angeles Pittsburgh

PASSAIC, NEW JERSEY
THE OKONITE-CALLENDER CABLE CO., INC.
Chicago Dallas Detroit Atlanta
St. Louis Washington San Francisco

OKONITE QUALITY CANNOT BE WRITTEN INTO A SPECIFICATION

Lovely to Look at . . . but

A MIGHTY TOUGH SPOT FOR BURIED CABLES



THIS CABLE is 4/0 single conductor insulated with 10/64" of 40% Amarine with tape and braid over all. The cable is laid directly in the ground with no external protection whatsoever.

TREASURE ISLAND, the site of the GOLDEN GATE International Exposition is "made land." This beautiful spot was literally pumped up from the bottom of the sea. The soil which composes Treasure Island contains quantities of salt and other deleterious substances. Where could one find a spot that offered tougher conditions for cables to resist?

The Engineers of the Golden Gate International Exposition thoroughly investigated rubber insulating compounds for use in their buried feeders which must supply the various buildings and equipment on Treasure Island. The result was that they specified Amarine 40 or its equivalent and purchased a large quantity for this service.

Amarine-40 is an insulating compound designed especially for cables operating under water without protection of lead or other water-proof coverings. Its outstanding characteristics are low water absorption, low specific inductive capacity, good aging qualities and high insulation resistance. Amarine compound is still serving in some of the earliest installations of non-leaded submarine cable. Its excellent properties were the reasons for the Exposition Engineers' decision to use Amarine-40 for this severe service.

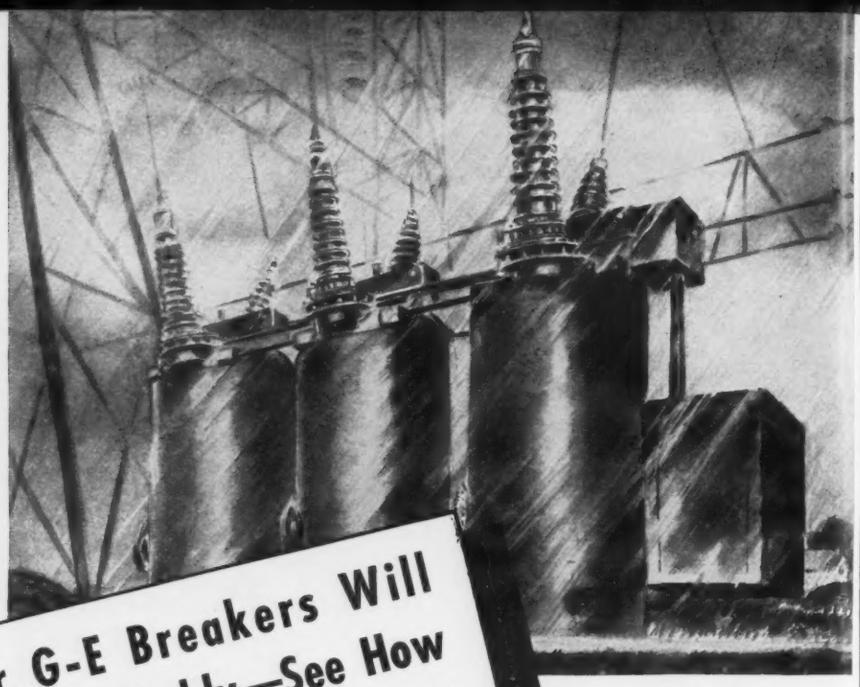
COLUMBIA STEEL COMPANY · *San Francisco*

Pacific Coast Distributors of Electrical Wires and Cables for American Steel & Wire Company

United States Steel Products Company, New York
Export Distributors

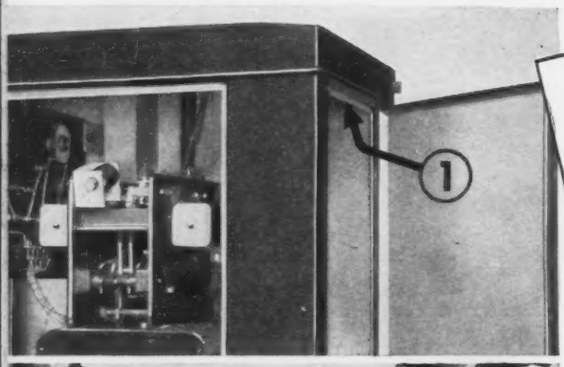
UNITED STATES STEEL

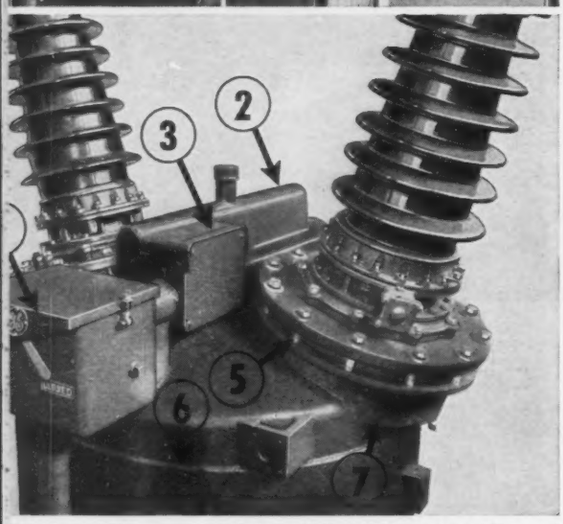
LET IT RAIN!

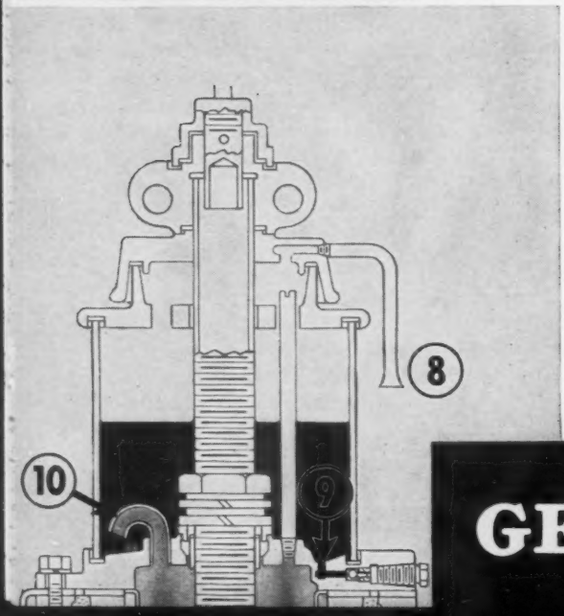


Type FHKO-339
15 to 230 kv

Your G-E Breakers Will Operate Reliably—See How They're Protected Against the Weather







1. Wide eaves and deep door flanges on the operating-mechanism housing.
2. Mechanism box welded to the dome.
3. Metal bulkhead inside separates mechanism box from interior of breaker dome—crank passes through bronze bushing to transmit motion to moving parts.
4. Triple protection where mechanism enters breaker—an inner seal, a gasket, an overhanging cover.
5. Plenty of bolts for a good gasketed joint.
6. Dome welded to the tank.
7. Bushing supports raise the gaskets above the surface of the dome.
8. Breather tube with bell mouth to keep water from siphoning into the expansion chamber of the oil-filled bushing.
9. Sump to trap condensed moisture and to permit draining it.
10. Thermal seal prevents oil in the expansion chamber from mixing with the oil in the bushing.

You know the importance of keeping breaker insulating oil free from moisture. You have seen here ten of the many precautions built into G-E outdoor breakers—evidence that G-E oil-circuit-breaker designers recognize the extreme importance of mechanical perfection. Ask our representatives to explain in more detail the value of each of these features. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

890-69

3 BIG FEATURES

make these the

OUTSTANDING OIL CIRCUIT BREAKERS

Hundreds of Reliable Installations

Type RWE, 115 to 287 kv.

1. MOTOR CONTROL

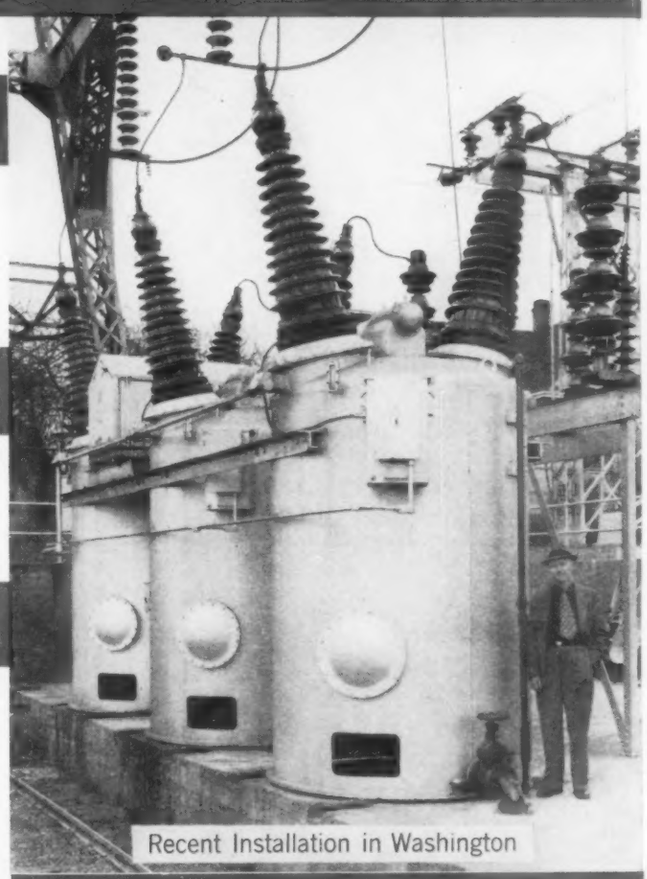
Here's fast closing and opening for 115 to 287-kv. breakers. Also both fast closing and opening for all larger breakers and in addition, immediate first reclosing for the lower interrupting ratings. Springs operate the motor-wound mechanism. Equipped with emergency hand winding.

2. SHORT ARCING TIME

For short arcing time, reduced contact burning, no tank pressures, less oil carbonization—utilities rely upon Pacific Electric Breakers equipped with Expulsion Chambers which make immediate reclosures possible.

3. LOW-COST METERING

You save money—as separate tank, oil and bushings are not needed when you use our exclusive CP Current Transformers of high accuracy.



Recent Installation in Washington

Search where you will, pay what you may—you cannot find oil circuit breakers with all these money-saving and dependable features which are found on Pacific Electric Breakers. Nor can you find such quality, such reliable design. Send for Bulletin No. 61.

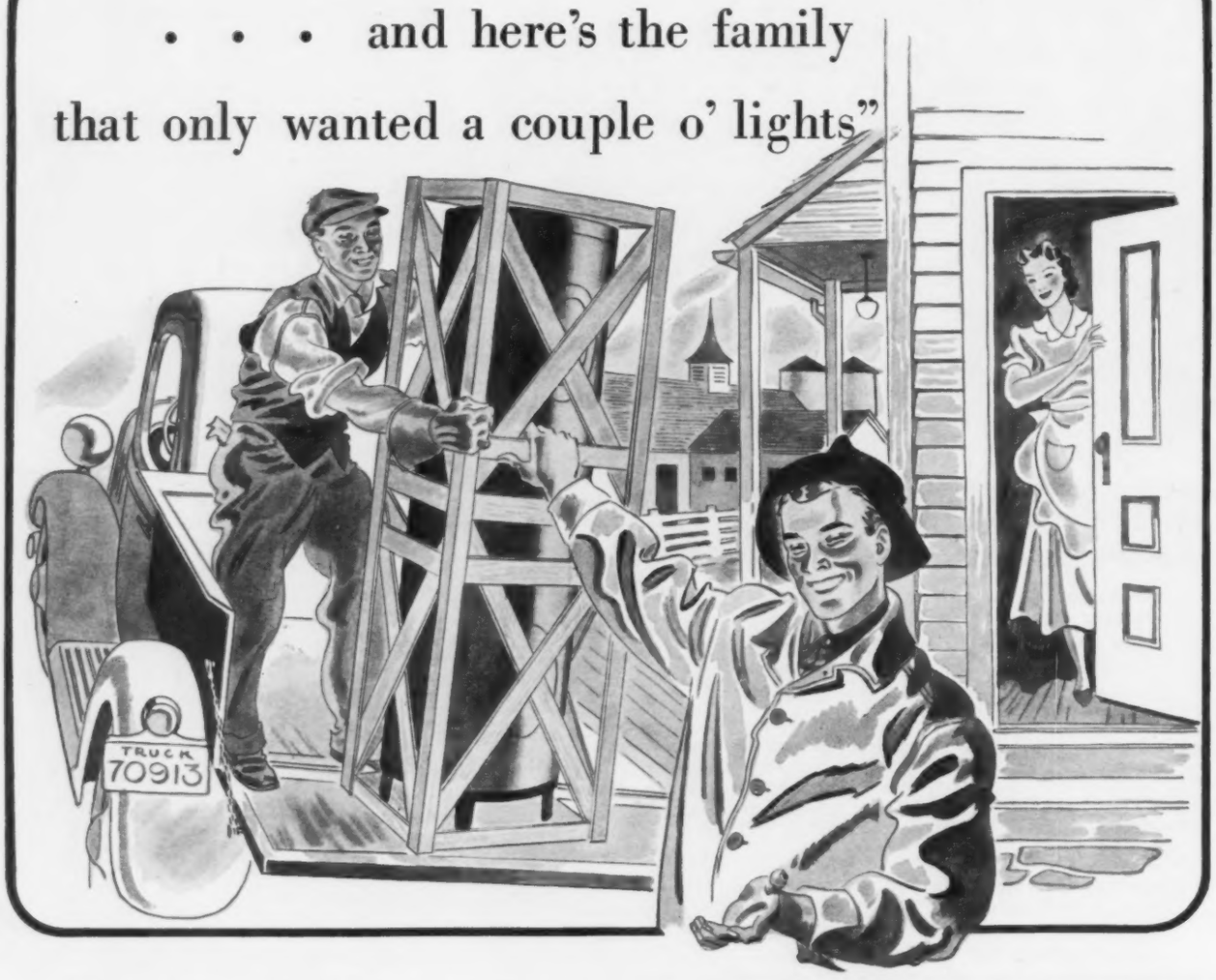
You SAVE MONEY ON LOW FIRST COST, HAVE QUICK SAFE INTERRUPTIONS AND FAST CLOSING

Pacific Electric Mfg. Corporation

5815 Third St., San Francisco — Dunes Highway, Gary, Indiana

Representatives in Principal Cities

. . . and here's the family that only wanted a couple o' lights"



"Water heater today . . . a range a few weeks ago . . . and I'll bet we'll soon be milking their cows for 'em!"

That's what comes of an intelligently planned rural promotion plan hitched to natural desires for easier living. Lucky thing that the engineer who laid out the rural line and the tap line running into this farm specified A.C.S.R. for the conductors. It has ample conductivity to allow for such growth.

Aluminum Cable Steel Reinforced also has high strength, which permits long spans and, consequently, reduces first costs. It is highly resistant to corrosion. Standards of construction established by A.C.S.R. engineers assure long life and low maintenance costs. Aluminum Company of America, 2132 Gulf Building, Pittsburgh, Pennsylvania.

A·C·S·R

FOR RURAL LINES

FOR POWER TRANSMISSION

ALCOA

Goodbye DOBBIN!

A candid camera shot brought us this story without words . . from a farm community in which nearly 500 Square D Multi-breakeRs are giving 100% trouble-free service.

The picture tells the story. The horse has given way to horsepower on the farm. His collar hangs idle in the barn.

Right next to the old collar is a new Square D Multi-breakeR . . . controlling the new power that has come to the farm . . . electricity for lights, for cooking and for driving the mechanical equipment.

The Square D Multi-breakeR is the ideal entrance equipment for the farm. It eliminates the need for fuses or the temptation to use dangerous substitutes for fuses.

A great convenience in the city, it is a near necessity in rural communities where distance and weather conditions make service calls slow and expensive.

For all rural electrification, specify the Square D Multi-breakeR. It brings customer good will, a saving in service expense and more profit on the "pay side of the meter."

CALL IN A

SQUARE D COMPANY

LOS ANGELES - MILWAUKEE - DETROIT

IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

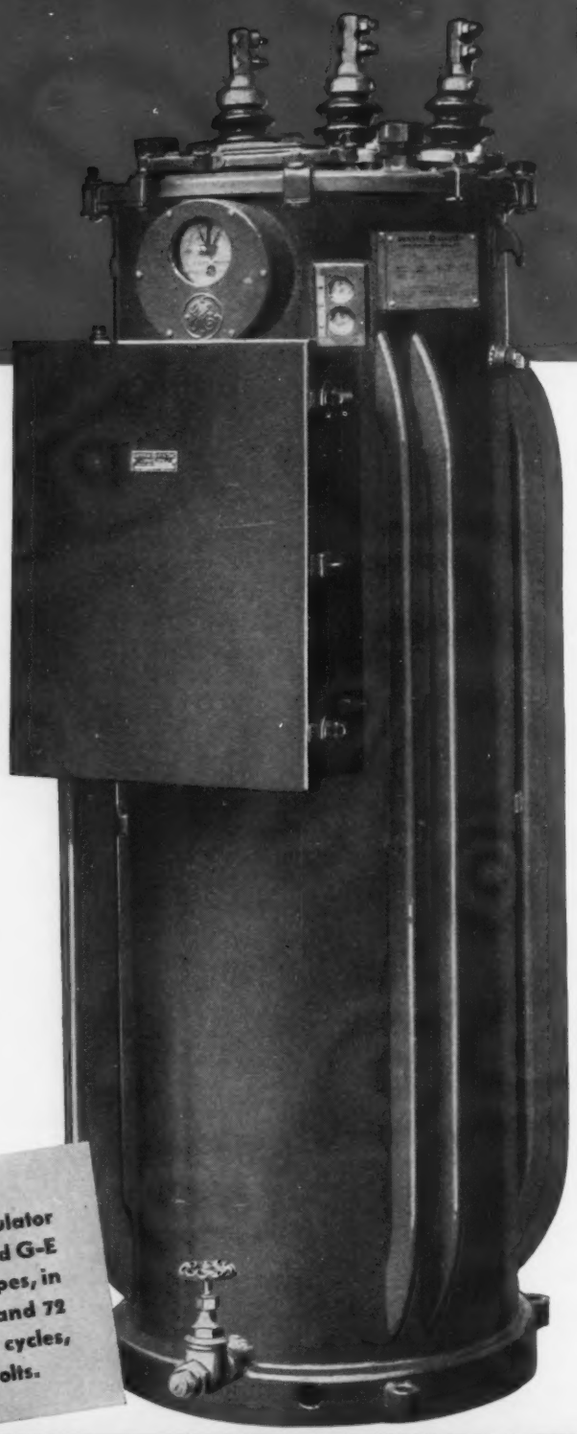
SQUARE D MAN

NEW G-E INDUCTION REGULATOR

Lower Installed Cost

Lower Maintenance Expense

More Flexible in Application



HERE'S a new G-E induction voltage regulator that will do a better job at lower over-all cost. It is not only lower in price than previous G-E outdoor regulators—made possible by standardizing on a single design for indoor and outdoor service—it's much easier to install, simpler to maintain, and more flexible in application.

You can place this regulator in service more quickly, because it's shipped oil-filled, and the motor and control supply is completely self-contained. The three cover bushings have terminals arranged to clamp the line conductors conveniently in either vertical or horizontal positions. Make only these three main-line connections, and the regulator is in service.

Maintenance is reduced. No lubrication is required, because the driving mechanism is under oil. Braking is dynamic—no wear—no adjustments needed. All control elements are *doubly* protected from weather and dust—yet readily accessible.

You can apply this regulator to installations of *all* types, indoors and out, single- and three-phase, without control or supply connections of any kind, and without interconnections between regulators. For complete information, ask for Bulletin GEA-2985. General Electric Company, Schenectady, New York.

NOTE

This new induction regulator supersedes the standard G-E outdoor and indoor types, in ratings of 36, 48, 60 and 72 kva single-phase, 60 cycles, 2400 volts and 4800 volts.

GENERAL ELECTRIC

ELECTRICAL WEST Vol. 81, No. 5
November, 1938

ELECTRA'S HUSBAND

1,000,000,000,000,000 Kw.-hr.

"WHAT are you mumbling about?" Electra asked the other night as I worked over a pile of papers and reports spread out on the bridge table. "'Ten million, two billion, six million.' You sound like Amos 'n' Andy. Are you worried about the national debt, the 30-Thursday plan, or your next year's income tax?"

"Please dear, don't disturb me. One of my worthy engineering confreres has recently said that the use of electricity in this country is going to increase ten times in the next seventeen years. I'm trying to check him."

"Well," Electra said with that tone of finality she sometimes assumes, "if I left the switch turned on 24 hours a day on all the electrical stuff you've filled this house with, we wouldn't use ten times as much electricity as we use now. That's silly."

"That's what I think, but I want to be sure," I commented. "Now let me alone."

Here is the problem: J. D. Ross, Bonneville Administrator, states that from 1887 to 1929, the annual electric power output of the U. S. increased from 157,000,000 to 91,400,000,000 kw.-hr., or 582-fold in 42 years. Thus ouput doubled every 4½ years, or increased tenfold every sixteen. Including the depression period of the thirties to give a 50-year span, output doubled every five years and three months; this is a tenfold increase every eighteen years. His conclusion, in the light of these facts, is that seventeen years hence the U. S. will be using 1,210,500,000,000 kw.-hr.

"A thousand billion—why those are astronomical figures," Electra gasped when I showed her my worksheets.

She only vaguely followed the remainder of my computations. She could understand how any inaccuracy in the figures for 1887 would make a decided difference in the rate of increase, and she nodded approval when I assured her that the gathering of statistics was a haphazard affair in those days—that few accurate and complete data were available until the census of manufactures was undertaken. Her knowledge of arithmetic and progressions failed her when I tried to explain how the rate of increase had been declining. By taking census figures for five year intervals, I tried to show her that in 1902-7 the growth was 2.34-fold, for 1927-32 it was only 1.07 fold. To eliminate the depression period, I used ten-year intervals. For 1902-12 the increase was 4.6-fold; for 1927-37 it was only 1.55 times. She began to comprehend when I showed that by the same argument, in 1935 there would be 220,000,000 automobiles in use in the U. S. Finally she took paper and pencil and did a little figuring for herself.

"Here's your answer," she said. "Our darling nephew Johnny was ten years old last week. He weighed 87 pounds. When he is twenty-seven, he ought to weigh ten times as much. That's 870 pounds. We'll put him in a circus sideshow and his earnings will support us. Won't that be grand?"

"You're crazy!"

"I was going to say that about your engineering friend's figures, but instead I'll just call them slightly exaggerated."

BEING the wife of a so-called electrical expert is sometimes a chore to Electra. Women friends ask her questions she cannot answer. And then, too, some of them make suggestions which she brings home to me. Just the other day she met a housewife who abhors cords, particularly on her floor lamps. In fact she refuses to use them because she won't have her floors littered up with cords.

This particular woman, however, was observing. She had seen an adequate-wiring exhibit in which some multi-outlet assembly material (the NECode designation for "plug-in strip" or "plug-mold") was on display. So she was struck with an idea. She wants to know why this cannot be set flush in her hardwood floors. Then she wants her floor lamps to be fitted on the base with a plug. To move a lamp she wants merely to pick it up and set it down over another outlet.

Electra asked me if it could be done. I don't see why not.

BY way of ameliorating some of my critical remarks about sales tactics in the field of gas refrigeration, I call to attention an example of gas-electric cooperation. In Denver the gas company is promoting IES lamps and better light-better sight via radio announcements and in the demonstrations in Gas Hospitality House. In addition, it is giving away three IES lamps each week as attendance prizes. There are many other opportunities where these two great industries can work together.

TELL the editor of that paper which prints your effusions that he's off his base," Electra said after reading one of that gentleman's editorials. "He criticized the industry for not stocking the equipment and appliances the utility was selling. Well I went into the power-company office up where our summer cottage is located to get a 200/300/500-watt bulb for that new IES lamp you brought up. They didn't stock it. And they didn't have any 100/200/300-watt lamps either. I looked around the office and asked the girl what kind of floor lamps were in the display along one wall. They were IES lamps according to her. So I asked her if I couldn't have a globe out of one of them. She gave it to me and then couldn't find the price in the catalogue. She said she would include it in next month's bill."

Just by way of clearing the record for the young lady, I asked a metropolitan dealer about the price of the lamp. It wasn't printed in the manufacturer's catalog. He had written it in the margin in pencil. "They don't give us much information that we can use. Nice sales displays and consumer dope. About all we know sometimes is what we read in their ads," was the way he described the unfortunate situation.

The Electrical Industry Is at the Cross Roads

By C. J. STRIKE*
President and General Manager,
Idaho Power Co.

AS WE review the history of industrial development it is significant to note that every industry followed a somewhat similar course. It had its origin in the field of discovery or invention, passed through its period of pioneering, eventually reached its peak of public acceptance and then in too many instances grew away from a sympathetic understanding with the public it was privileged to serve. History further reveals in many instances the loss of capital—the result of a constantly recurring cycle of prosperity and adversity—and coincident therewith the rise and fall of individuals who attempted to chart the course, or possibly to state it more aptly, who tried to outguess the problems of the day.

Our industry followed a course similar to that of all other industries with this significant exception: No industry experienced such rapid growth and almost spontaneous public acceptance of its service as did ours.

The Politicians' Delight

We reached a peak of public acceptance in the late twenties. Since that time we have seen our business dragged into the political arena, with our integrity seriously challenged by those who would poison the public mind against us. Today we find ourselves perplexed, frequently wondering whether or not we are entirely without honor and whether or not our efforts have been in vain. Our industry is in the public spotlight and is one of the most widely discussed national questions of the day. This is possibly a natural development, for no industry is more closely interwoven with the home and business life of every individual. Thus the power question automatically becomes a fertile field for political exploitation.

Long ago I learned a simple principle that where there is smoke there is usually fire, and when fanned it usually breaks out into a blaze. Fire fighters study their problems carefully, plan their attack and usually get the fire under control. From observation and experience, I am afraid that too many executives of the light and power industry have allowed the controversy to get under their skins. They have struck back bitterly and often blindly, with the result that in many instances they have actually created the issue for the politicians, when with the application of a little strategy and a good job of living with the people, the question might well have failed to become a vehicle for demagogic politicians.

We should never lose sight of the fact that a politician depends upon the voters to keep him in office. He seldom has a record of accomplishment, and he is obliged to select some subject around which he can prejudice the public, thereby making his bid for office. The way to beat the self-seeking politician at his own game is to go ourselves to the people with a straightforward story of our performance.

We must keep in mind that politicians propel themselves by one of two methods:

By talking of their accomplishments.

By creating an issue which when carefully seasoned with prejudices and even class hatred will find a responsive chord in the public.

Off Main Street

If we are to take the electric light and power issue out of politics then we must understand the tactics of politicians. We must refrain from striking back at them. Instead we must take the question off Main Street in every community we serve by proving to the public that we have done an acceptable job.

In ordinary times it would be sufficient to do an acceptable job, and that alone would entitle the industry not only to public acceptance but also to protection from the government it helps to maintain by its tax dollars. Today, in an unsettled business world with demagogues preying on the prejudices of the people, we apparently must go further and prove that the industry has measured up to its responsibilities.

It seems to me that we as an industry are subject to one common criticism: We failed to keep the public informed as to the necessity for the changes which have taken place within the industry.

For Instance:

Our record is one of new invention and constant improvement in equipment and methods. Thus there has been created a situation where obsolescence has taken place much faster than the industry could provide reserves from its earnings to meet the renewals and replacements resulting therefrom. Management has floundered between this problem and the problem of maintaining a sufficient amount of earnings available for interest in order to attract capital to the industry. As an industry, we have never taken more than a fair return for interest on a fair value of property dedicated to and used in the public service. Unfortunately, as an industry, we have failed to provide adequate reserves to meet the problem of obsolescence and replacements, and thus many privately owned utilities today find themselves unable to compete successfully with the hypothetical comparisons of more modern equipment.

This situation, in my opinion, is not the result of mismanagement, but rather is the result of rate reductions during the past 25 years which in too many instances were not justified along sound economic lines. True, at the time they were greatly appreciated, yet today we are facing a problem as an industry which would be largely eliminated had we given more consideration to the subject of obsolescence and depreciation as it was accruing against us.

It seems to me that American people have a right to expect management to

* Extracts from an address before the Rocky Mountain Electrical League, Yellowstone Park, Aug. 29, 1938.

B. C. Electric Railway Co. appeals to the folks on Main Street through a full-page newspaper ad (see condensed version on opposite page). Not only does the ad give recognition to hard-working employees, but it also shows that the company and its employees are human beings, just like Main Streeters themselves. This particular copy appeared in some special editions in Vancouver papers; specially altered copy appeared in Victoria papers

give lowered rates as the result of savings from the improvement in the manufacture and distribution of electrical energy, *so long as those improvements are the result of a normal development.* On the other hand, I do not believe that the American people expect our industry, or any other industry, to measure up to a hypothetical yardstick, based not upon normal development through the field of discovery, invention and improvements, but rather upon a yardstick which is the result of not only complete tax exemption but a direct subsidy by the taxpayers of the nation.

Our capital investment is constantly under fire by those who are quick to point out that the companies' property could be replaced for less than it is now recorded on the books. With this statement, we should quickly agree; but we should point out that we could not wait until 1938 or any other given year to build our entire properties. Instead, we were obliged to build them piece by piece and year by year, as the demand for additional electric service required.

Financing Competitive Systems

In 1933 when the country was in the depths of a business depression we were confronted with a new philosophy of creating prosperity by a program of public works designed to run interference, so to speak, for private business. I believe it is a correct statement that a great majority of the American people understood this to mean a program which would not be in direct competition with tax-paying institutions.

Under the provisions of the National Recovery Act, federal funds were made available to the various alphabetical agencies to carry on the program; and in spite of the increased tax burden our industry like all other industries cooperated to the fullest extent. No sooner was the program under way than we were confronted with the fact that *our tax money* was being used to finance competitive electric systems, and we as an industry were confronted with the

FAMILY ALBUM

daguerreotypes showing the kind of life led by a public utility company and its 3,750 employees.

1. *B.C. Electric linemen are called out in wind, rain, snow or sunshine in order that you may have uninterrupted service*

2. *Len Turner, route sign impresario, puts these finishing touches on a 40-foot roll in Kitsilano shops*

3. *Rosemary Springer and Marilyn Frederickson herald the B.C. Electric coronation float, grand prize winner at 1937 Canada Pacific Exhibition.*

4. *Members of the B.C. Electric transportation department who make up the Radials, one of Vancouver's crack football teams, posing for their picture.*

5. *Bus Operator, F. P. French, Victoria, pilots his bus through flooded Shelbourne street, December 28, 1937*

6. *"Saturday Night" at the Mount Pleasant barns. B.C. Electric street cars undergo systematic beauty treatment*

7. *Miss Jean E. Mutch, B.C. Electric home service director, talks over a culinary problem with two members of her department, Miss Jean Gibb and Miss R. Walker*

8. *Foreman Bill Utterbach watches linemen D. McLeod and W. Kennair at work on the trolley wires*

9. *Ralph Gram and S. J. Bowman, B.C. Electric agricultural representatives, put on a broadcast during one of the B.C. Electric farm radio programs.*

10. *B.C. Electric employee, E. Vilac, Kitsilano bridge tender, opens his bridge to let a boat go through.*

16. *Members of the B.C. Electric Symphony Orchestra rehearsing for a radio broadcast during the winter months*

17. *B.C. Electric flanger pushes snow back 9 feet from tracks so that automobiles might get through streets.*

18. *Old-timer Charles Green, foreman of the armature winding shop, has been 47 years in the service of the B.C. Electric.*

19. *Visitor to Vancouver Exhibition receives free "sight selector" test from Miss Betty Kirkby.*

20. *Matthew Brown, gas works chemist, makes one of his 1500 tests a year to maintain quality of gas manufactured by the B.C. Electric.*

PRESIDENT

BRITISH COLUMBIA ELECTRIC RAILWAY CO. LIMITED

three following serious handicaps:

First, this new competitor enjoyed complete tax exemption.

Second, this new competitor received an outright gift of 45 per cent (nearly one half of the capital investment).

Third, this new competitor received the balance of the capital investment in the form of a loan at 4-per-cent interest from the federal government.

The electric light and power industry differs from the ordinary mercantile business in that the interest on capital investment constitutes its largest item of expense. In addition to this, taxes are a much more important factor than in other fields of business because of the heavy capital investment in physical property. Few people recognize the unfairness of this new government competition, and that is one of the chief reasons why the persecution continues.

A Damaging Admission

As I have watched the various competitive situations develop, I have been impressed by the fact that in many instances the private utility management has endeavored to prove its ability to meet such a competitive situation. Did it ever occur to you that as we indicate our ability to meet such hypothetical, subsidized competition, we automatically admit that our present rates are earning more than a fair return? Let me give you an example:

In the case of Idaho Power Co. its gross operating revenues for 1937 were distributed as follows: 25c out of each dollar of gross revenues expended for operating expenses; 13c out of each dollar of gross revenues expended for upkeep and provision for replacements; 21c out of each dollar of gross revenues expended for taxes; 29c out of each dollar of gross revenues expended for interest on the money used in the business; 12c left in surplus for contingencies.

Note that only 38c constitutes what might be termed as controllable expenses, and that 50c of each dollar of gross operating revenues of the company represent taxes and the cost of money.

If the Idaho Power Co. could be relieved of all taxes, if it could be given the benefit of an outright gift of 45 per cent of its invested capital and if it could receive a 4-per-cent government loan to finance the balance—*then it could reduce its rates 37.5 per cent.* In other words, the loan-and-grant principle plus tax exemption reflects a handicap to us of 37.5 per cent.

If the question before the people is "cheap electricity," is there any logical reason why private utility operators should not be given the benefit of the same governmental assistance as their publicly financed competition?

It seems to me that this is the story which should be told to the American people so that they may fully understand the power question and the unfair competition with which the government threatens our industry.

No doubt the most misunderstood part of our business is electric rates. It seems to me that we should establish an easily understood definition of electric rates, and may I suggest the following:

"A medium to distribute costs."

If an electric company served but one customer there would be no occasion for a rate schedule, as all the expenses, including fixed charges, would be charged to that particular customer. Because the average company serves thousands of customers under varying conditions of consumption and demand, it is necessary that a schedule of rates be adopted which equitably distributes costs to the customers served. When government steps in and transfers a portion of these costs to the general taxpayer under the guise of irrigation, navigation, flood control, etc., it seems to me that we are obliged to develop such facts and to prove to the public that our tax-exempt competitor is shifting approximately 37 per cent of the legitimate expenses over against the general taxpayer.

To be sure, we are vitally interested in irrigation, navigation, flood control, etc., and where electricity is a logical by-product it can be absorbed by existing producing agencies, and any savings thus obtained under present methods could and would be passed on to the public in the form of reduced rates. In other words, such savings would reduce the present production costs. Thus the rate schedules could be reduced accordingly.

No Desire for Change

In my opinion, it is not necessary even to purport to meet a hypothetical comparison with a tax-exempt, subsidized situation. It is necessary only to prove that our business is efficiently operated, and that these same principles of tax exemption and subsidy will, if applied, wreck every business on Main Street now operated by private capital. In other words, if such a system is adopted by the people, then those same principles should apply to every other industry, business and profession, and the entire American system should be changed to that standard. Whether we would be better off under such a system can best be determined by examining conditions today in such countries as Russia, Italy, etc., and then by asking the American people if they wish to try the experiment.

I do not believe that the American people, in the face of accomplishments in this country, have any desire to change our system of industry, business and professions, from one privately owned and operated under government control, to one governmentally owned, operated and controlled. I am firmly of the opinion that they expect us only to adjust our operations to eliminate, insofar as possible, any inefficiencies which may have crept into our business and to prove that, cumulatively over a period of years, we have successfully met the economic changes which have confronted the industry.

Further, we should take advantage of our opportunity to prove that we have proportionately divided the benefits which have accrued from our growth and development between the three principals involved, namely: *the employees*, in the form of increased wages and shorter hours; *the public*, in the form of improved service and reduced rates, and *the investors*, in the form of a fair return on the prudent investment in the business.

Earlier I stated that about the only differences noted after the completion of a business cycle were the loss of capital and the constant change of personnel in the field of management.

Challenge to Management

Let me say that the electric light and power industry has made a commendable showing and will continue as a privately owned and operated industry under reasonable government regulation. Let me say further that the management personnel of the future will consist of men not only capable of managing, but also of men who have the ability to prove to their employees and to the public that the integrity of the business is maintained at a high standard, and that the three principals (employees, public and investors) have been fairly and equitably dealt with. This is the challenge to management today. And when these facts are laid before the American public in an unprejudiced manner, then, and not until then, will the electric-power issue be taken out of the political arena; for a politician never continues to ride an issue that is not popular on Main Street.

We will get no place if we allow the challenge of the politicians to get under our skin. The executive of tomorrow will be the one who not only bounds back when knocked down, but who also protects his company and himself by actually taking the initiative in proving to the public that his company is honestly and efficiently operated and that his *customers are obliged to pay only a schedule of rates which covers the actual cost of efficiently rendering the service, a fair return on the prudent investment and that portion of the constantly increasing tax bill for which we are obliged to serve as a collector.*

Building Goodwill With Pictures & Pensions

Two Tried-and-True Methods Find Three More Adherents

ELECTRICAL companies are more and more turning to motion pictures as a public-relations medium. Now comes to light their use by British Columbia Electric Railway Co.

Actually the B. C. company was one of the pioneers in this field. But now the company has released figures proving the actual value of motion pictures. During a recent nine-month period more than 10,000 persons attended approximately 100 showings of the films.

And, says Harold J. Merilees, sales promotion manager, the public's interest in the films has been so great, and the program for this year has been filling up so rapidly, that "we are finding it necessary to select carefully the various groups" before whom the pictures are shown.

These groups are of all kinds, reason being that the films themselves are of all kinds. Merilees estimates that there are between ten and fifteen different reels covering subjects such as home and commercial lighting, farm electrification and farming in general, flower gardening, a vacation in Honolulu, etc. Most of them were taken by members of the company's staff. The Honolulu picture was, for instance, shot by Vice-President E. H. Adams.

In addition, the company maintains an exchange system with other Canadian industries, who supply pictures on fishing, lumbering, etc. Canadian General Electric Co. is the outstanding contributor in this way.

Obviously, such a variety of films cannot be exclusively devoted to electricity. For that reason, British Columbia clubs feel that they are not necessarily boosting the company in asking for a film as program filler.

A partial list of the organizations which seek this movie service includes: B. C. Home Makers' Classes, conducted by the company's home service department; YWCA vocational guidance groups; Vancouver Electrical Assn.; political organizations; exhibitions and rural affairs (attendance at these is not counted in the 10,000); high schools; farmers' institutes; junior farmer clubs; fraternal lodges; church groups; senior and junior boards of trade; the University of British Columbia; various electrical and gas industry groups; cooperating dealer groups; Retail Merchants' Assn., and sometimes, as last summer, such an unusual group as a crowd of Australian boys touring Western Canada.

For other companies who are contemplating such a program, however, Merilees sounds a warning: "There is danger in such a program of allowing it to become abused by the various groups because, after having once enjoyed such a program, they are prone to return to it frequently as an easy method of presenting entertainment. We watch this angle very carefully, and this year are insisting that all groups provide their own program into which we may fit our film presentation as a supplementary attraction."

AS a step toward improving community relations, Pacific Gas and Electric Co. is now producing a series of twelve talking motion pictures in color—one for each of the divisions of the company's territory. Each will be on the order of a "know your community" feature. They will be used as program material for various community organizations and will be available to schools, etc. Some may be exhibited in the little theater which will be a part of the P. G. & E. exhibit at the Golden Gate International Exposition.

This program is an outgrowth of the success of a talking picture, "Behind Your Electric Switch," which the company completed in 1936 and showed throughout California. The new pictures are aimed at depicting the historical, industrial, agricultural, domestic, civic and cultural features of each section of California served by the company. Only indirectly will the contribution of electrical service to community growth and development be emphasized.

Considerable latitude is being given division personnel in suggesting material to be included and the extent to which the company story will be featured in the continuities, prepared under the direction of Al C. Joy, advertising manager. The script for the commentator will be prepared after each picture is filmed, and the sound track will then be added. The commentator has not been selected and consideration is being given to conducting an audition among employees to discover a suitable "voice."

In addition to these twelve films, two others are being produced. One of these will cover the company's contributions to fish and game conservation in connection with its hydroelectric developments. It will show fish ladders at dams, fish hatcheries, the artificial lakes which have been constructed and stocked with fish, fences built along flumes to keep deer from drowning, together with ramps constructed to permit their egress from flumes in case they fall into the water. The second film will depict the company's extensive natural-gas service facilities.

The pictures are being produced in the newly created photographic department under the direction of John Stanton, a capable and experienced cameraman. Upon completion of the films, the company will have fifteen motion pictures which will be available for programs for all classes of civic, community, fraternal and other organizations in its territory.

ECONOMIC security for employees is one of the surest ways of making friends for a large or small company. Realizing this, W. P. MacDonald, manager of Nanaimo-Duncan Utilities, Ltd., B. C., has announced establishment of a pension plan for permanent employees.

For the past six years the company has maintained a group life-insurance scheme for permanent employees. This, however, was not felt to be sufficient. Hence the development of the pension plan.

Under this plan, every permanent employee will be retired at the age of 65 with a pension based upon his length of service and salary at time of retirement. Specifically, the plan embraces all employees who have had one year's continuous service with the company.

At present 60 employees are cooperating in the plan on a contributory basis. It costs these employees a total of $1,600 a year deducted from their salaries. The company contributes $6,000.

Should a man leave the company's service prior to retirement age, he will be refunded the entire amount he has contributed to the fund, without interest. Should an employee die before reaching retirement age, the amount he has contributed, less interest, will be turned over to his beneficiaries.

Off With the Old and On With the New

Washington Water Power Co. practises its preachments by modernizing and completely relighting its general office building in Spokane. Results: Happier employees, more sales

By LADNER V. ROSS
Illumination Engineer
Washington Water Power Co.

CULMINATION of a long list of lighting and relighting installations on Washington Water Power Co.'s properties during the past twelve years was the complete electrical modernization of the general office building in Spokane.

The building was old. Erected in 1906, it had in its day been as modern as any. But 1938 comfort features, conveniences and facilities for adequately handling a greatly increased personnel and volume of business were necessary. So, in the fall of 1936, after considerable study of all requirements, a plan for remodeling was finally determined on.

Now, two years later, the building once again takes a leading position in modernism.

For the most part, the work consisted of improving the old building consisted actual new work was the extension of floor space on the second, third and fourth floors out to full ground area and the construction of a partial fifth floor. This entire operation was completed in fourteen months with virtually no disturbance to the 800 employees.

New wiring was installed throughout the building from a new underground vault, through a modern distribution center, consisting of one main 2,500-amp. circuit breaker and four 800-amp. switches, to three 750-amp. four-conductor busbar risers. The fourth switch feeds power equipment in the basement. This new switchboard replaces a marble antique containing some 35 open-knife switches, many of them blackened by overheating.

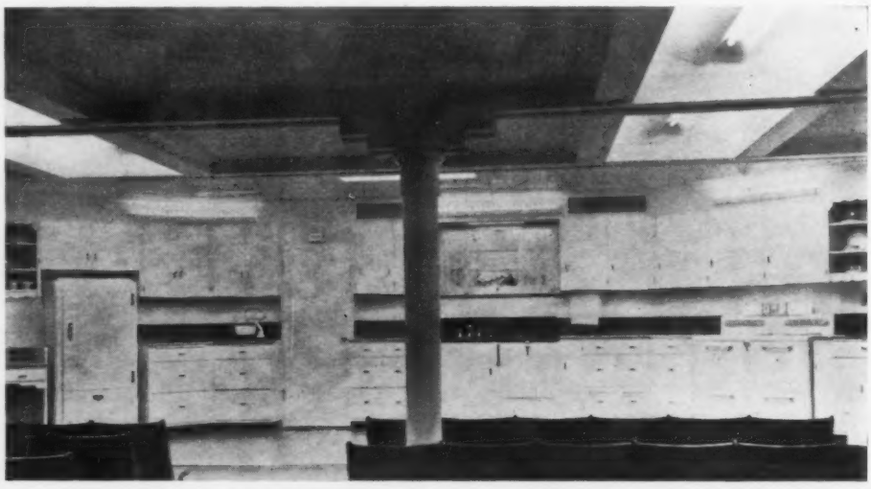
Power equipment in the basement is fed by disconnect switches connected to a busgutter, while motors on other floors are fed by the nearest panelboard. Three-phase, four-wire, de-ion circuit-breaker panel-boards are tapped off the bus-way risers at each floor.

All conduit work was replaced with electric metallic tubing and vapor-proof connectors. All branch circuits were wired with No. 12 intermediate grade wire; No. 10 was used where runs were long or heavily loaded. Initial lighting loads were usually limited to 1,000 watts per circuit, and only two main ceiling lighting outlets were connected to one 15-amp. breaker. Three-wire circuits were used in general.

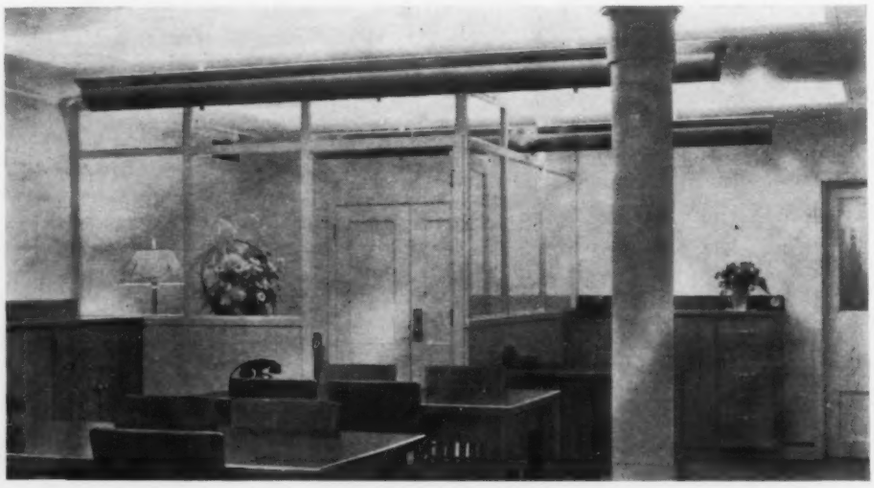
Plug-in strip was used extensively along active portions of base-boards, in the rear top edge of salesroom counters, in cashiers' cages, on top of the back splash of model kitchens and food laboratory and for lumiline lighting in the auditorium ceiling. For baseboard use, plug-in strip was fed from six pull-boxes distributed around the outside wall of each floor. Initially, about 30 ft. were connected to a circuit, thus permitting doubling of the footage before exceeding the code limit. All baseboard is designed to fit plug-in strip, while black-painted wood inserts have been nailed into spaces not now equipped.

The lower portion of the baseboard is removable, revealing a wiring space for telephone wires. These are distributed from junction-boxes on each floor through conduit to pull-boxes in the outer walls. Under-floor telephone wiring is in conduit to cast-iron floor-boxes.

A network of conduit connects floor-



Above: Home service department's auditorium. Ceiling troughs have 40-watt lamps on 7-in. centers, alternately wired on three circuits, and exposed colored 30-watt lumiline lamps. Lumiline lamps behind silhouette signs, under upper cabinets, behind window. Downlight on stage consists of four lamps (any required wattage) with open louver and pin light. Plug-in strip above all work surfaces and baseboards. Border lights (not shown) have 100-watt lamps on 6-in. centers, three circuits, covered with flashed opal glass. Below: Home service department's office. Three 10-ft. troughs with 75-watt lamps on 6-in. centers, painted flat-white inside. Alternate lamps on separate switches. With half of lights on there are 30 ft.-candles of illumination; with all lights, 60 ft.-candles



boxes symmetrically placed at 9-ft. intervals all over the salesroom floor. Extension outlets are connected as required. They supply plug-in strip in counters, appliances and advertising displays on the floor. Similar installations of under-floor conduit are employed throughout the building where desks are set out from walls or partitions.

Particular care was taken to assure adequate and balanced voltage for all lighting requirements—a point too frequently overlooked even in new buildings today. Lighting was designed to accomplish two purposes: To offer the maximum in comfort and good-seeing conditions for our employees; to illustrate modern practices to our customers.

Preliminary calculations were based on 5 watts per sq.ft. for upstairs offices and 7 watts per sq.ft. for the main-floor salesroom and high-ceilinged offices. It was thought that, with light-colored paints, these values would produce an average of 30 ft.-candles on upper floors and 40 ft.-candles on the main floor. However, as the work progressed there entered into the problem many unforeseen factors such as bulky air-ducts, difficult room shapes and accoustical treatment of ceilings.

Through the use of a totally indirect luminaire which was available for either 300/500-watt PS lamps or 750/1,000-watt bi-post lamps many of the structural handicaps were overcome by merely changing sockets and lamp-neck husks to accommodate the higher wattages required. Approximately 90 of the 210 conventional ceiling-type luminaires utilize the 750-watt bi-post lamp.

Flat-white paint became the final answer for all ceilings after reflection tests made on the most paintable of accoustical materials proved a loss of reflecting area that reduced the total reflection factor by about 6 per cent. A very light green is used on all walls except the salesroom, where a pale, robin's-egg blue is used. Woodwork is light oak on upper floors, walnut in the salesroom and ivory in the basement. All bright metal is finished in satin chrome.

The final results show average lighting levels of 20 to 45 ft.-candles on all desks in the building. This reaches a high of 60 ft.-candles in the drafting room, where no accoustical treatment was used on the ceiling. In the salesroom the readings range from 40 to 60 ft.-candles. These may fairly be considered maintained values since many parts of the building have been completed and in use for at least a year.

The entire building is air-conditioned with mechanical cooling and oil-washed filtering, which, combined with regular, enforced cleaning schedules for all lighting equipment, means that little further deterioration is to be expected.

All offices and the salesroom have totally indirect lighting, except for supplementary lighting. Halls have semi-indirect lighting; service areas are equipped with direct-lighting reflectors, and washrooms have semi-direct lighting lumiline wall-brackets on the sides of each mirror.

The alleys on both inside faces of the building are lighted with 200-watt angle reflectors with globes and guards on 20-ft. centers at the second-floor window sill line. They are controlled by a time clock with astronomical dial.

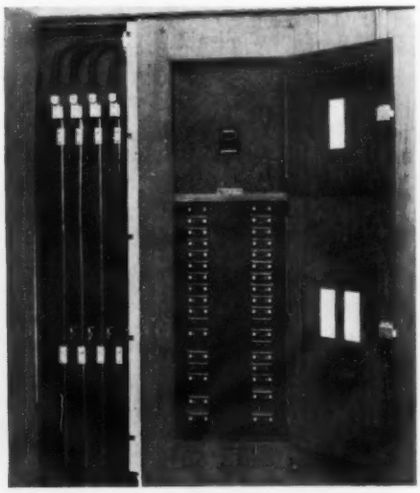
Because low ceilings would have created a problem of ceiling brightness had conventional pendant fixtures been used, and because there was some space above the ceiling for recessing a reflecting trough, trough lighting was used in the system operator's office, the auditorium, the home service department offices and the mailing department office. In each case a wiring channel with socket is employed inside a metal trough painted flat-white. Unusually good efficiencies were obtained by careful shaping of the ceiling reflecting surfaces, also painted flat-white.

That this thorough relighting job has been widely appreciated and approved is evident. Not only has there been a striking improvement in eye comfort, but there has also been so much added to the attractiveness and cheerful atmosphere of the building that visitors invariably comment on the lighting.

And, best of all, it has had a stimulating effect on the sale of IES lamps for homes, and it has helped the company to close several large commercial jobs that have been worked on for years.

Above: Credit department. Problems created here by air-ducts and unpredictable equipment are handled by use of 750-watt bi-post lamps. Below: Salesroom has eight 300-watt inside-frosted lamps in inverted show window reflectors round each column; three 40-watt inside-frosted lumiline lamps in wiring channel in each rib of column cases. At left rear are model rooms; right, cashier's cages

Above: Typical large office room has 500-watt inside-frosted lamps in totally indirect luminaires on 9x9-ft. centers. Under air-duct, 300-watt lamps are used; in enclosed offices, 750-watt bi-post lamps. Below: Typical section of 750-amp., 3-phase, 4-wire busbar riser with cover removed, and panel-board showing main circuit breaker and branch single- and double-pole and 3-phase breakers



The Ramblings of a Fluorescent Salesman

Daylight color value has great appeal to clothing shops—Roos Bros., San Francisco

By C. P. WALLIS
Incandescent Lamp Department
General Electric Co.
San Francisco

NOW that the fluorescent lumiline lamp has been on the market for several months and all branches of the electrical industry have had an opportunity to see and appreciate some of its advantages, it is time for the man on the street, the lighting salesman or lamp man, to say his say.

Those of us who sell realize the necessity for presenting salient advantages in order to create in our prospects the desire to purchase or in order to demonstrate to them their need of our product. The fluorescent lamp has many of these. Color quality, color effect, high efficiency, low heat production or generation, flexibility and the means with which to increase lighting levels on present overloaded circuits form our bag of tricks in our sales approach.

Daylight color value is an advantage with great appeal to art galleries, printing plants, haberdasheries, clothing shops, the rug and drapery departments of furniture stores, jewelry stores, canneries, drafting rooms and offices where close visual work is performed. High efficiency will allow us to reach footcandle intensities necessary for many present-day visual tasks but sometimes unattainable with incandescent lighting in a practical manner. The producing of proper lighting intensities with low heat production will be a boon to air conditioning, while the savings in cost of operation and installation will tend to offset the possible excess cost of fluorescent lamps.

The color effects which we can create with this new light source give our prospects the means to individualize their offerings to the public. The effective blue, red and pink; the extreme efficiency and penetration of the green; the whiteness of the daylight, and the softness of the white give us an entire keyboard on which to play in the decoration of night clubs, restaurants, theaters and even hustling dairy lunches.

And let's not forget the flexibility of this tubular light source in its four new sizes. With it, directional lighting over a wide area becomes a simple, streamlined matter.

And again . . . How many times has the salesman been repulsed by a purchasing agent moaning: "We know we need more light, but our circuits are way overloaded now and we can't spend the money for rewiring?" With fluorescent we have the answer to this story.

But all this is rambling in a maze of advantages. Let's do a little retrospective rambling in our last several months' experiences in San Francisco.

We park at the Masonic Temple and, leaving the elevator at the sixth floor, enter the large hallway, made into a portrait gallery. We are met by a flood of daylight achieved by only ½ watt per sq. ft. of fluorescent tubing. . . . From here we go to a Market St. radio-parts store which has just sold and delivered a daylight unit for a large sewing machine in an overall factory where the eyestrain was terrific. So sold was the radio store's owner on the installation that he himself is now about to relight his 40 ft. of show windows with fluorescent.

Next we move into the industrial section, where we demonstrate and sell a small installation for a composing stone in a plant that does color printing. . . .

Back across town again, we talk to a retail merchant of floor and table lamps. He is going to make up special units of fluorescent for table and desk lighting. Particular emphasis, he says, will be on a unit which can be clamped to a desk or drawing board for students. . . . Then we go down the street to a nationally known flower shop which is greatly interested in the color effect of fluorescent.

Now to a large office building where a milling company has its general offices. The stenographic or transcribing room is a problem. Thirty-five ft.-candles from 4,000 watts of incandescent lighting; temperature, that of a Turkish bath. Fluorescent will be the solution. . . . Next we call upon a hat store which is moving into a new location. We ask the owner what sells hats —color, shape, style or what?—and he emphatically declares "color." So we talk daylight fluorescent lighting.

By this time we're beginning to feel the need of nourishment, so we cross the city to North Beach to lunch at an Italian cafe. Before we dig in, however, we talk to the management about fluorescent lighting for a new "spot" to be opened for the fair. Fortunately the architect, an artist who knows and understands colors and color effects, is present. He is much impressed by a demonstration, and once again we chalk up prospect.

By this time we have begun to feel that this selling job may be too easy. So back we go to a merchandising establishment, which is modernizing its drapery department, in order to get our feet on the ground and see what has developed from earlier calls. Result: Forty-eight units, and the statement that the fluorescent lighting has more than justified its cost by increasing the saleability of the draperies. Here the manager draws us aside to show how the daylight fluorescent brings out all the colors in a complexly designed piece of material, how the nap on a chair covering seems to be drawn out and how an American-made rug looks like a genuine Persian.

With a nice order in our pocket, we next visit one of the city's leading jewelers. The store is very modern, having some 50 ft.-candles of general lighting, but the owner has not been satisfied with the results over his diamond display cases. Having previously exam-

ined the fluorescent, which brought out the whiteness and sparkle of the gems, he now decides to spend $100 for a four-lamp, custom-built fixture on one case. It's only a trial, he says, but we know he'll probably be back for more.

Now we set out across the bay to a large canning and packing operation. Tomatoes coming in by trucks are dumped on a traveling belt to be washed and graded. Bad spots must be discovered while the belt speeds its endless way by white-garbed operators. Our demonstrator, using a daylight lamp, hangs over the belt while the purchasing agent stands by and watches. True color is emphasized by the light; specks which could not otherwise be seen appear. The girl operator's face brightens as she finds her task made easier. And at the suggestion of the PA we write down in our little book another prospect's name.

On our way back to town we stop at a community hardware store where the dealer has already sensed the appeal of fluorescent window lighting and ordered his neighborhood electrician to install the job. He says that he personally has canvassed his local business area and sold several jobs for which he will supply the lamps. So the hardware dealer has got the jump on his electrical competitor.

Thus end our ramblings. But the day has convinced us of one thing: We have struck gold.

We have a product, the advantages of which are endless and the proofs of which advantages are extremely easy to give. We have a door-opener to the purchasing agent's office, to the merchandise manager, to the plant superintendent, to all, in fact, who are planning to manufacture or sell services or products. If we attack the sales problem of fluorescent lighting with our feet on the ground and by making an honest effort to sell what the product does rather than what it is, our field is unlimited.

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San Francisco Department Makes Fluorescent Tests

A step toward sensible wiring rules for fluorescent and mercury-vapor lamp installations is the result of tests by the San Francisco Dept. of Electricity. These were performed in cooperation with manufacturers in order to determine operating characteristics and power factor.

Average of several readings made from tests of the 15-watt, 120-volt and the 30-watt, 240-volt fluorescent lamps and their auxiliaries were as follows:

Lamp Wattage	Volts	Amp.	Volt-Amp.	Watts	Power Factor
15	120	0.34	40.8	24.5	0.602
30	240	0.37	88.8	47.5	0.533

Starting current inrush on 220-volt equipment was found to register 0.9 amp. for at least 1 sec. It was also found that in normal operation the auxiliary operates at slightly above room temperature of 68 deg.

As a result, it was recommended that where fluorescent tubes are used in continuous coves or strips not more than 30 of the 15-watt type or 15 of the 30-watt type be installed on a single circuit having circuit overload protective devices set at a maximum of 15 amp.

Tests on the mercury-vapor lamps and transformers likewise proved that power-factor corrective equipment is needed. Tests were made on 220-volt, 400-watt mercury-vapor lamps, first with an individual transformer of the straight inductive type, later with the power-factor corrected type. With the 400-watt lamp on power-factor corrected transformer of the auto type, rated at 220 volts, 2.9 amp., input was 450 volt-amp. Tests made at the 107-volt taps showed the following:

Start	112 volts	6.6 amp.
1 min.	111 "	6.6 "
2 "	108 "	6.3 "
3 "	108 "	6.1 "
4 "	107 "	6.0 "
5 "	107 "	5.7 "
10 "	110 "	4.5 "
12 "	110 "	4.4 "

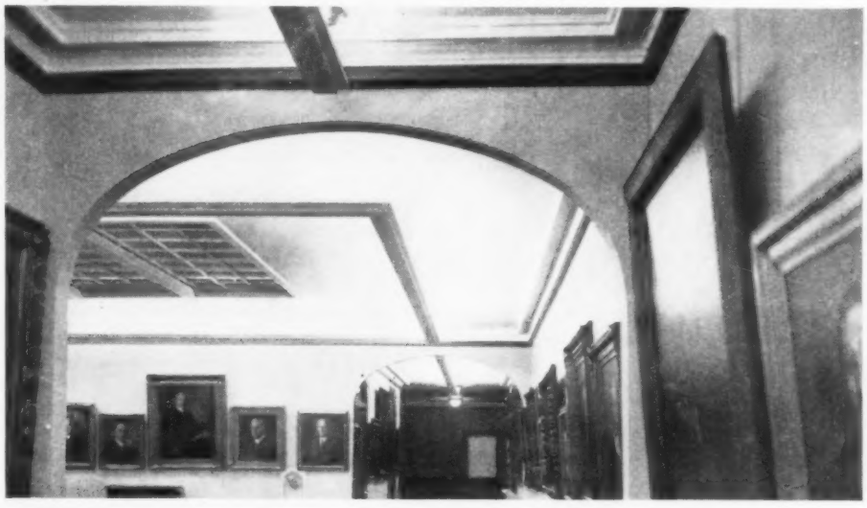
After twelve minutes the current was constant. Average current for the test was 6.12 amp.

Results with the inductive type of transformer were:

Start	107 volts	11.2 amp.
1 min.	108 "	10.7 "
2 "	107 "	10.3 "
3 "	106 "	9.9 "
5 "	106 "	9.2 "
8 "	107 "	8.0 "
11 "	106 "	6.2 "

Current was constant after eleven minutes. Average current for the test was 8.37 amp.

Recommendation as a result of these tests was that not more than one of the inductive-type transformers nor more than two of the power-factor corrected type should be installed on 1,500-watt or 1,500-volt-amp. rated circuits with 15-amp. maximum circuit protection.



The Masonic Temple job—sold by Orville Johnson of Graybar, engineered by Robert L. St. John

Indirect light for general lighting, direct for show-window lighting—a small nut store

Before and After Lighting Modernization

San Bernardino's (Calif.) public library is one of the best-lighted libraries in the U. S., according to members of the library board. The claim is probably not exaggerated. The completely modernized lighting system provides a high quality of even, glareless illumination throughout the building. Need of improvement was emphasized by a number of tests which showed that only 5 ft.-candles of light were present on the reading room tables (left). An even lower level was found in the stacks. The new lighting fixtures, however, supply 44 ft.-candles of light on the tables (right). Eleven ft.-candles are provided in the stacks. Ceilings were repainted in the modernizaiton process

Touring Troupes

G. E. and Westinghouse send out shows to sell more lighting

One thought occupied the minds of two manufacturers, General Electric and Westinghouse, who last month had troupes touring the Western states. It was: To promote more and better lighting.

G. E. Supply Corp.'s show, in which Holophane Co., Miller Co. and Curtis Lighting Co. cooperated, was presented in Spokane, Portland, Seattle, San Francisco, Sacramento, Fresno, Los Angeles, San Diego, Phoenix, Butte, Boise, Salt Lake City, Denver and El Paso. Although speakers were drawn from regional General Electric and GESCO staffs and consequently varied in different sections of the West, typical presentation was that at San Francisco.

There speakers included C. W. Goodwin, San Francisco GESCO district manager; Leo Gianini, G. E. lamp department engineer; Walter Carlson, G. E. Lamp division, and Arthur Dahl, GESCO construction materials sales manager.

Said Goodwin: Market possibilities for the new lighting developments are unlimited. Nine out of every ten present-day lighting installations are inadequate for proper seeing. Sales of Mazda lamps have increased from 60,000,000 in 1907 to 510,000,000 in 1937; a conservative estimate for 1942 is 750,000,000 lamps. The trend is toward higher wattages. For lamps of 100 watts and smaller, the 1937 sales increase was 58 per cent over 1932; for 150 watts and over, the increase was 91 per cent.

Gianini demonstrated new light sources. He said the new bi-post high wattage lamps open new fields for relighting commercial buildings by permitting fixtures which fit low ceilings. The new luminiscent tubes are arousing great interest, he said, and have many applications. They will not, however, supplant incandescent Mazda lamps for some years to come.

Dahl outlined sales possibilities and sales technique of "light for seeing and light for selling." To turn the information presented into actual sales, he said the various G. E. organizations have formed a lighting committee in each region. Four-point program of these committees is: (1) The development of a more efficient sales organization in the industry through sales training; (2) cooperative sales activities with utilities and contractors; (3) provision of displays and demonstrations, and (4) an organized sales program. Backing up this drive is an advertising campaign aimed at all classes of customers.

Westinghouse Lamp Division's presentation was handled in the West by two troupes. One, leaving San Francisco, has already visited Santa Cruz and Watsonville, Calif.; Reno, Salt Lake City and various Northwestern cities. It will cover the Southwest this month. The other troupe left St. Louis to cover eastern Montana, Wyoming, Colorado and New Mexico.

These sales-building caravans formed one part of a comprehensive three-way program designed to coordinate the dealer-jobber and public-utility activity of the Westinghouse division. Second part of the program is the complete lighting loadbuilding plan for utilities which is presented every year. Third part is a new business campaign for jobber-salesmen.

The caravans were equipped and ready to present any kind of program for almost any kind of audience—dealers, jobber-salesmen, utility men, parent-teacher associations, luncheon clubs, etc. A ton of special demonstration equipment was taken along either, as in the San Francisco division's case, in a trailer or in a truck.

Most important part of this three-point lighting program is, however, the jobber-salesmen campaign. Objectives of the drive are: (1) to get a greater number of jobber-salesmen interested in the lamp business, and (2) to acquire the better type of dealer and industrial contracts.

Although all Westinghouse jobbers have been invited to participate in the campaign, which started Oct. 1 and ends April 1, their participation is optional. Jobbers may enter as many salesmen as they desire. Monthly prizes will be awarded to every salesman enrolled if 60 per cent of the men secure one lamp contract during the month. A grand prize has been established for the leading jobber in each division.

Sprinklers

Prove their value by irrigating 1,200 acres of a California ranch

Electrical applications which increase production, decrease labor costs, increase efficiency, reduce the cost of production or permit premium crop marketing are the aims of rural electrification engineers. Overhead irrigation falls in this category because it permits more efficient water utilization by reducing the amount of irrigation water as much as 50 per cent; it makes unnecessary the leveling of land, and it has the inherent benefits of actual rainfall. All these advantages are demonstrated in the sprinkling system installed on the Hotchkiss Ranch near Firebaugh in the San Joaquin Valley. Said to be the largest sprinkling installation in California and perhaps in the world, the system irrigates 1,200 acres of land adjacent to the San Joaquin River.

In 1937 the entire acreage was in cotton. This year 600 acres are planted to cotton, 400 to sugar beets and the balance to miscellaneous crops. Water is pumped from a system of canals and distributed over rolling land that would have cost $40 to $50 an acre to level for furrow or flood irrigation. Leveling would also have cut the productive value of the land in many places by removing the top soil.

Irrigation is accomplished through a series of permanent mains to which are attached portable lines equipped with sprinkler heads. There are 5½ mi. of 8-, 10- and 12-in. mains, and to these 18,000 ft. of portable lateral mains are connected. The revolving sprinklers extend 1,100 ft. across the fields on each side of the mains and are so spaced that they produce overlapping strips of rain-like spray 120 ft. wide. These portable mains are made up of quick-coupling sections of 4-in. galvanized pipe, each of which is equipped with a riser and sprinkler head. Running at 70-lb. pressure, the sprinklers throw an acre-inch of water per hour, or in two hours the equivalent of a 2-in. cool, refreshing, cleansing rainfall. A total of 140 acres is irrigated every 24 hours.

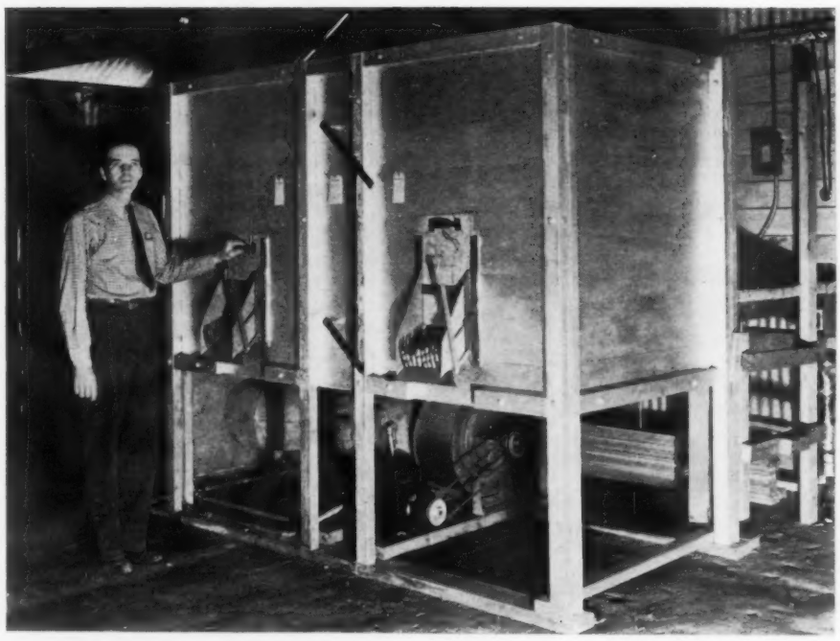
Five-and-a-half miles of 8-, 10- and 12-in. mains extend from three pumping plants. To them are attached 1,100-ft. portable laterals equipped with sprinkler heads which deliver an acre-inch of water per hour. An even distribution of water is secured over 120-ft. overlapping strips

Water under pressure is supplied by 360 hp. in booster pumps divided as follows: one 150 hp., one 125 hp. and one 75 hp. The three pumps have a total capacity of 7,500 gal. per min. Power is supplied by San Joaquin Light & Power Corp.

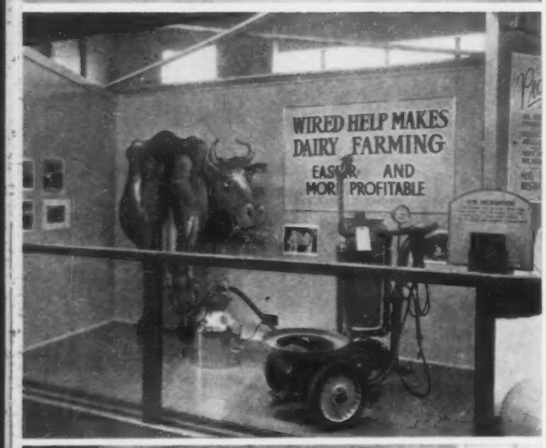
Advantages of the system based on operation to date are these: Less water is required than with ditch irrigation. The crops may be started in dry ground and irrigated into cultivation. A sprinkler system has a tendency to keep the crops clean of dust, to cut down plant disease and discourage insects. A perfect spread of water is secured over uneven ground. Labor cost is not excessive; two men are able to set up one line while one strip is being irrigated. The ground is worked at its original contour without leveling.

The installation has proved also that this type of irrigation is ideal for cotton. Prior to its use, large acreages of cotton had not been irrigated by overhead means.

Walnut Dehydrator for Individual Ranches



Successfully tested during the recent harvesting season was this small walnut dehydrator built by Charles A. Bush (above), Simi, Calif., walnut grower, for use on individual ranches. A ¾-hp. electric motor circulates heated air through the machine's two compartments. One per cent of moisture is extracted per hour. Capacity is 1,250 lb. of nuts, and during a 30-day harvest the machine handles about fifteen tons. The dehydrator is easily moved and requires no special wiring. Its 7-ft. height makes it possible for the owner to load it with nuts from a truck or platform



Self-explanatory pictures of Southern California Edison Co.'s extensive rural electrification exhibit at the Los Angeles County Fair

Ensilage

Tractors are replaced by 5-hp. motors in cutting & hoisting

By CECIL A. ROOT
Sales Supervisor
Northwestern Electric Co., Vancouver

Cutting and elevating ensilage with a 5-hp. motor is not a new idea. But, though the idea is several years old, little has been done in a practical way to educate the farmer, who is used to a 20- to 30-hp. tractor, to the fact that it not only can be done but that it is also a very practical thing to do and that the power cost is so low as to be of no consequence whatever.

An entire season of demonstrations by Northwestern Electric Co.'s rural service department on all kinds of cutters under all kinds of conditions has proved the point to dozens of farmers in Northwestern territory.

This should not be misunderstood, however. Merely to deliver an electric motor to the average farmer not already familiar with motor characteristics or not particularly adept in the handling of machinery and say, "There you are, go to it," is to invite failure and dissatisfaction. Neither can the inexperienced utility rural service man start out to demonstrate in this field and expect to have unqualified success right from the start. There are certain limitations and methods of procedure which must be carefully learned.

For instance: Northwestern's very first demonstration was in connection with a large, old-fashioned cutter and blower. An experienced man, if he took the job at all, would have done so with his fingers crossed. Rocks had punched several holes in the bottom of the fan chamber; the blower pipe was choked with rust; cutter knives had been freshly sharpened but had not been carefully set.

The first trouble was belt slippage. In starting, or with a momentary overload, the belt was almost sure to come off. Fortunately the Northwestern men were using their own motor, purchased specifically for demonstration purposes. Included besides the motor were a sliding base, a magnetic starting switch, a cut-out switch and a meter, all mounted on skids fitted with four convenient handles. Three pulleys of 5-in. face and 4, 4½ and 5 in. in diameter respectively, and a 20-ft. endless rubber belt completed the set-up.

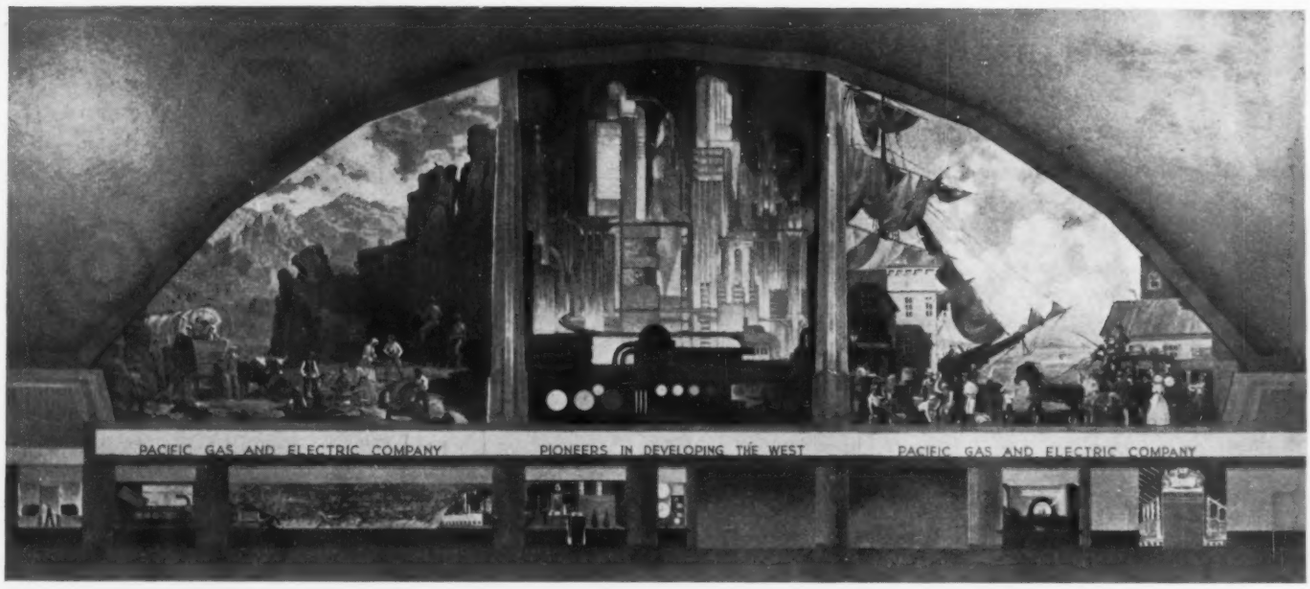
Therefore, finding the whole program of demonstrations liable to failure because of belt trouble, the men decided it was well worthwhile to substitute a Rockwood Drive (tilting) motor base for the sliding base. This, along with a generous application of a recommended belt dressing, ended drive troubles once and for all.

Next trouble: In order to elevate the chopped corn the 35 or 40 ft. to the top of the silo the men found it necessary to speed up the cutter to give a speed of some 600 r.p.m. on the fan. At this rate the motor was easily overloaded and, in order to prevent stalling, the corn had to be fed very carefully. Finally the motor was shut down and the holes in the fan housing mended. Then, as the rust wore out of the blower pipe and its interior became smooth and slick, it was found the fan speed could be cut down to only a little over 400 r.p.m. The speed change was made by substituting the 4-in. for the 5-in. pulley. This eliminated almost all the excess load on the motor except for unimportant momentary overloads due to uneven feeding. On the whole the cutter could not be fed corn as rapidly as the carrier would deliver it to the knives. The blower pipe, of course, should be kept vertical.

Subsequent jobs proved the importance of the things already learned. Large machines and small machines were tried. The large machines as a class would cut slightly more corn per hour with the same power, though there was usually more of a tendency for the operator to overload the motor. But once the persons responsible for feeding had developed a steady, even flow of corn which would load the motor right up to its capacity the results were surprising to every farmer. In case after case practically as much corn could be cut and elevated under these conditions as had formerly been put away with a 20- to 25-hp. tractor belted to the drive shaft.

The experience of Joe Wills at Woodland, Wash., is representative. Wills put some 24 tons of corn into his silo. Starting out by feeding the cutter very cautiously, he soon found that if he fed evenly he could put his corn through at the rate of about 10 min. per ton. Another thing he learned was that it took just slightly more than a kilowatt-hour per ton—29 kw.-hr. in all, to be exact.

Strictly speaking, a motor for a silo-filling job alone is probably a poor investment for both the customer and the utility, which must provide extra transformer capacity. As a rule, however, additional uses are soon found for the motor. Feed grinding, irrigation, hay baling, wood sawing are all jobs largely within the power requirements of a 5-hp. single-phase utility motor.



P. G. & E.'s diorama will cover the entire south wall of the Palace of Electricity

Industrial Sales

An electric furnace solves the iron foundry's problems

SEE COVER

Rapid advances in metallurgy during the past two decades have thrust upon the iron foundry a problem of no mean proportions. This problem makes itself evident in several forms; but in the last analysis it is the result of one thing—competition from steel. One southern California foundry, the Ace Foundry of Huntington Park, has solved the problem by installation of an electric furnace for duplexing cupola iron.

The duplexing process is a method of controlling the composition of iron beyond the limits imposed by the cupola. The molten iron from the cupola is introduced into the electric furnace where it is further heated and its composition corrected by the addition of steel, carbon or silicon to produce an iron of ideal properties for the type of casting desired. If an alloyed iron is required, the alloys are also added in the furnace.

The electric furnace used by the Ace Foundry is of the indirect-arc, rocking type, has a capacity of 6,000 lb. of molten iron and is supplied from a 300-kva. transformer with current at 100 volts. To facilitate charging, it is located directly below and in front of the cupola spout. The arc passes between the ends of two electrodes and heats the metal by radiation. Except during charging and pouring the furnace is rocked continuously.

Advantages of duplexing cupola iron in a rocking-type electric furnace are many: The rocking action thoroughly mixes the charge and thus produces a homogeneous casting of uniform structure. The composition and properties of the casting may be controlled with mathematical precision. The properties of the casting—i. e., tensil strength, deflection, transverse strength and ease of machining—may be improved to a point far beyond cupola iron. Metal is saved because the first "heat," usually pigged because it is too cold to pour, is heated to the proper temperature. And, by reason of the fact that nothing but scrap need be used in the cupola because the correct carbon-silicon balance for iron is produced in the electric furnace, cost of producing this superior iron is from 5 to 10 per cent less than the cost of producing the best straight cupola iron.

These advantages, say Southern California Edison Co. engineers who helped in the Ace Foundry installation, should be investigated by all iron foundries, large and small, doing quality work. Duplexing with an electric furnace "will enable them to regain much of the lucrative business lost to steel castings and put them into a position to go after new applications formerly considered out of the cast-iron field."

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Finis

Portland G. E. steps entirely out of merchandising business

Portland General Electric Co. completed revision of its merchandising policy last month when it closed the electric-appliance department in the Electric Bldg. Henceforth the company aims to help dealers to merchandise ranges, refrigerators, water heaters and other appliances through its dealer-promotion department.

Announcing the move, A. C. McMicken, general sales manager, said: "Our company is ceasing this operation in the hope that a satisfactory volume of electric automatic water heaters, ranges, refrigerators and other appliances can and will be sold to its customers by dealers. If, after a fair trial, the volume of any one or more major domestic appliances is not satisfactory to the company, it reserves the right to resume the direct sale of such appliance or appliances or to adopt such sales policies as are deemed necessary to insure the desired volume."

In closing out its stock, the company gave its employees first opportunity to purchase appliances at company cost plus actual delivery and installation charges.

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Exhibit

By P. G. & E. at San Francisco fair will cover 4,000 sq. ft.

First exhibit to take concrete shape in the Palace of Electricity at the Golden Gate International Exposition is Pacific Gas and Electric Company's monster 6,000-sq. ft. three-dimensional diorama which will cover the entire south wall of the building. The complete exhibit, embracing 4,000 sq. ft. of floor area, is aimed at depicting the contribution of electric service to the growth and development of California. It emphasizes the low cost of electricity in this area.

To the spectator who enters the palace, center of the display's interest will be the animated diorama, built in three sections (see cut). The left section will show a '49 immigrant caravan stopped for the night in a mountain

pass. The life-size figures are all electrically operated — a pioneer woman mixes sour-dough batter in a bucket as her male companion talks and occasionally pours water from a jug; a mountaineer fans the campfire with his hat, stopping at intervals to see if the fire blazes; etc. In the center section will be a metropolitan city of the future, with vertical and lateral movement as well as mobile lighting. The right section will depict the San Francisco waterfront of the 90's, with full-rigged sailing ships, a stage coach and more than twenty human figures. All of these will be animated. Done in brilliant natural colors, the entire diorama is to be illuminated with white light with effects being created by varying the intensities.

Under the balcony which carries the diorama (which is 180 ft. wide by 57 ft. high by 25 ft. deep) will be a series of smaller exhibits covering different phases of electrical development. The first will show farm electrification, emphasizing the high degree of saturation and the extensive use of power on California farms. Next will be a breakdown of the family budget into seven classifications, showing the electric bill as only 1.7 per cent of the total. A feature of this will be the lighting effect which permits the showing of various services which go to make up the electric bill in the average home.

Next will be a relief map of the company's territory on a scale of 25 mi. to the inch. On it will be shown power plants, reservoirs, power lines and natural-gas pipelines. This will be illuminated to permit the transition from daylight to dark. Explanatory legends will give information on the area served, population, etc. In the next display an electric robot, operated by remote wireless control, will answer questions relating to electricity when a spectator dials a number corresponding to any one of six queries lettered within the display. Following this will be the story of electric time, showing the master control clock, frequency control, radio equipment for receiving Naval Observatory time signals and finally a world clock which will give the exact time in various parts of the world.

Beyond the entrance doors, which break this section of the exhibit, will be two additional displays. One will show the comparative electrical development of the U. S. and other nations of the world. and the electrical development in California as contrasted with other states. A second display will depict eight examples of different commodities manufactured in California. It will show what proportion of the cost of manufacture is represented by electricity. The west corner of the exhibit will consist of a motion-picture theatre with a seating capacity of 100. Here will be shown colored sound movies of the company's territory. In addition to the film there will be a demonstration of fluorescent-colored paint treated with ultra-violet or "black" light. There will also be a demonstration of the effect of too little light as well as colored light on the human eye, on foods, floor coverings, apparel and makeup. Purpose will be to emphasize the desirability of an adequate amount of white light for residential illumination.

The exhibit is being prepared under the supervision of Chad Hulburt, P. G. & E. display manager. It is being constructed by the Heinsbergen Decorating Co., general contractors, with the animated diorama being built under a subcontract by Delmar Gray, one of the foremost designers and builders of animated displays in the West.

The exhibit will be manned by a staff of fifteen specially selected and intensively trained employees. They are to be under 30 years of age, chosen for appearance and personality and are to receive thorough education on the company's properties and policies.

●

Commercial Lighting

Is Sold in Utah Power's territory by a traveling truck

One way of selling commercial lighting equipment in Utah Power & Light Co. territory is to bring the mountain to Mohammet. The mountain is an exhibit, sponsored and manned by utility men and contributed to by all firms allied with the better-light movement, which travels out of Salt Lake City to the small merchant. Already favorable results warrant complete coverage of the power company's territory.

Depression months gave birth to the idea. Economic factors in many instances prevented owners of small-town stores from visiting population centers in order to familiarize themselves with up-to-date standards of lighting. The exhibit, traveling in a single special truck, not only brings sample fixtures, lecturer, murals telling the story of lighting in specific fields and working models to the commercial user, but also adds novelty to stimulate the general public's consciousness of good lighting.

The display is a straight commercial selling show. All materials are handled by local distributors or jobbing houses. "We determined to improve commercial lighting in Utah Power's territory," says Sales Manager W. A. Huckins. "Because the small-town merchant was reluctant about coming to us, we decided to go to him." (See cut, opposite page.)

L. B. Gawan, manager of the company's commercial sales, devised a compact exhibit which includes everything from floodlights, model store fronts and structural glass to sodium-vapor lamps for highway lighting. Visiting industrial customers can actually work under 80 ft.-candles of light while doing fine processing.

Arriving in a scheduled town, the utility men rent a hall and set up the exhibit for an early preview by local dealers, who are told that an effort will be made to sell their lighting equipment and who furnish the exhibit with such units as they wish to display. Afternoons are then given over to high-school classes interested in lighting; local civic and business clubs are contacted, and evenings are taken up with two or three formal showings. At these a trained lecturer gives a better-light story, demonstrating applications of black light, the photo-electric cell, sodium vapor, fluorescent and zeon lighting.

Following each demonstration period, as during other intervals of the day, hard-fisted business men wander about inspecting merchandise handled by their favorite dealers, or they may meet by appointment representatives of the manufacturer and supply house. Should a prospect show interest in any specific equipment, that fixture is taken to his place of business by one of several demonstrators. The utility does not close the sale; instead it carries out promotional work from the preliminary invitation up to the close.

Home or residential wiring is also covered. It receives the attention of a home service advisor provided by the utility.

General public interest is obtained by advance newspaper and direct-mail publicity. To meet special requests, the troupe is prepared to give lectures on such topics as traffic safety, etc.

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Range Selling

A California company has a couple of result-getting ideas

By J. EDWARD TUFFT

Two ideas for selling electric ranges have been tried and proved eminently successful by B. L. Russell Co., major appliance store of Huntington Park, Calif.

First idea, used continually as a closing method, is the plan of giving every live prospect an exclusive, one-hour lesson in range cooking. Under this plan, the prospect is invited to the store. There, tutored by the store's home economist, she prepares one dish from the store's supplies. She does all the work herself, and when she is finished she

A corner of Utah Power & Light Co.'s traveling light-conditioning exhibit. Second from left is L. B. Gawan, commercial manager; Sales Manager W. A. Huckins stands at his right

takes home the results.

Value of the plan lies in its power to overcome the prospect's pet objection to electric ranges. Perhaps, for instance, she does not think the range will bake quickly enough. Perhaps she feels that broiling is slow. Whatever the complaint, the salesman who has dated her for the lesson informs the economist in advance. Without being obvious, she, in turn, stresses the point about which the prospect is skeptical. In every case, so far, the objection has thus been overcome.

In the interest of economy and efficiency, only about five prospects are scheduled per day. And every one of them is definitely live.

The second idea has been employed but once, but also with good results. Twenty-five women prospects were invited to see the cooking of a large turkey in a roped and padlocked oven.

The local utility company sent a man to put a lock on the rope, wrapped round the range across the oven in two directions. Then the home economist turned on the current, set the regulator and forgot about the turkey while she went on with other demonstrations.

At exactly the right time she went to the telephone and asked the utility to send a man to unlock the oven. He came and removed the padlock; the prospects unwound the rope and opened the oven door, and there was the turkey, perfectly cooked.

The dramatics of the stunt gave the prospects something to talk about and remember, and it proved beyond doubt that the range-timing could be depended on. It paid for itself immediately.

Owner Russell admits that the stunt could not be repeated very often; but women are still talking about it.

Miniature

How an 8-lb. model builds electric water-heater sales

Prize winning letters on "How I Sell Electric Water Heaters" brought out at least one original idea in the Modern Kitchen Bureau's August contest for retail salesmen. It was a model water heater.

Wrote the salesman: "A week later (after the idea had occurred to him) I stood on the doorstep of one of my oldest and toughest prospects. In my hand was an exact copy of a well-known electric water heater, weighing only 8 lb. empty. I had it constructed at a very nominal cost so that it could be plugged into the regular house current. It could be filled at the faucet and drawn off from a cock at the bottom—heated to a 100-deg. rise in seven minutes.

"Mr. Prospect had his hat and coat on, ready to go out, but when he saw my model he agreed to give me a few minutes to demonstrate it. Forty minutes later I came out with two orders for new electric water heaters. One from Mr. Prospect and one from a neighbor he had called in to watch the demonstration.

"Suffice it to say that in that campaign and every one since, I have gone at least 40 per cent over quota. My model, which can be turned out by any first-class metal-working establishment in a short time, was the best financial investment I ever made. And as an aid in making sales easier and quicker, its value is beyond estimation."

The salesman's conclusions about his model heater were these: The model takes the place of a demonstration of a standard water heater; it helps the prospect to visualize the product and its service. The model's novelty breaks down the immunity of most people to sales talks; it is more tangible than words. The model made people look, listen, ask questions and, what is often impossible and most important, think.

Western winners in the July and August contests were three Washington Water Power Co. salesmen: L. R. Carter and B. J. Denning of Spokane and Albert Gruber of Kamiah, Ida. They accounted for half the prizes awarded during the two months.

Use of a miniature unit to sell water heaters is also being applied to range selling by Electromaster, Inc., which is urging that dealer salesmen demonstrate the value of electric cooking with a portable, 2½-qt. "Vita-Miser Home Demonstrator." Except for the fact that the assembly is equipped with only one cooking unit, it is a perfect model of a standard range. Salesmen are told to demonstrate with it and leave it at the prospect's house for several days if necessary.

●

Half-and-Half

House builds interest & business for the whole industry

Take an ancient house, divide it in two and remodel one of the halves and you have an unique and valuable way of demonstrating to the public the advantages of home modernization. That is what was done in Spokane; and over 4,000 visitors examined and applauded.

The house, which was 28 years old, was one of the first built in that section. At the time it was constructed the materials were the best available, so the building was in a generally good state of preservation. But maintenance had been neglected and the plaster was weakened in spots by early roof leaks.

John I. Tuttle, present owner, saw the possibilities in the property and purchased it. At first he agreed to let the construction and industry committee of the chamber of commerce, which sponsored the display, demonstrate the value of new paint only. Then he agreed to let the committee develop a half-and-half project throughout the house.

Half of the outside was remodeled. The old overhanging eaves were replaced by a boxed cornice. Removed were vines, a hedge and an upstairs porch which shut out the light. Then this half was painted white with red shingles.

New garage doors were put in and half the wall given a coat of cement paint.

Inside, equally striking contrasts were secured. Half of each room was done

over with new paint, new wall-paper and refinished floor. This half was roped off. The public used the unfinished section.

In the living room, old ceiling beams were half removed. A high, leaded-glass bookcase was replaced by a Cape Cod window. The fireplace mantle was done over. New lighting fixtures which contrasted sharply with the style 28 years ago were installed.

In the dining room, half of the dark wood wainscoting was torn out and half of an old cabinet gave way to a Cape Cod window. A modern lighting fixture was hung alongside an old one.

The kitchen was completely remodeled, only an enlarged picture showing how the original kitchen appeared. The new room was all-electric and step-saving. Lights were installed under the cabinets, plug-in strip over the table tops and a flush light over the sink. Other equipment included an exhaust fan, clock, range and refrigerator. Final effect was achieved by new built-ins, linoleum, sink and paper. Result was that the kitchen became a bottle-neck through which it was necessary to drive crowds.

In the hall-way a heat trap was removed by building a sloping ceiling over the stairs. Two of the bedrooms upstairs were remodeled and two were left untouched.

The old bathroom fixtures were shown in one of these unfinished rooms. People could thus compare them with the new bath, with its up-to-date fixtures, mirror, lumiline side lights and supplementary built-in electric heater.

The old bedrooms showed cracked plaster, lopsided lighting fixtures with pull-chain switches and no convenience outlets. Dust-catching door and window casings were painted dark. In the new rooms were modern lighting fixtures, four convenience outlets, new wall materials, paper and woodwork painted in ivory.

Throughout the house visitors got the effect of stepping from the 19th century into the 20th.

To attract the public to the house and in order to make it stand out in its dark surroundings, four floodlights played on the exterior at night.

The special committee which handled details of the reconstruction work for the chamber of commerce committee consisted of L. W. Ditlevson, Inland Paint Service; H. C. Bender, Washington Water Power Co., and H. A. Halstead, Better Housing Bureau. The different Spokane business firms furnished the materials used; Owner Tuttle, who has just completed the modernization of the old half of the house, paid only for labor.

Spokane's "half-and-half" house. Originally the building was vine-shrouded and further darkened by an overhanging roof as at the right. After the demonstration ended, the old half was remodeled

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Future Campaigns

Christmas sales & expositions wind up the year

Utilities sponsoring dealer appliance campaigns are withholding announcement of any 1939 drives until the present year has run its course. Only five companies have scheduled anything definite for January. The following have, however, outlined plans to sell Christmas merchandise.

Arvada (Colo.) Electric Co.—During December the company will feature its Christmas promotion.

B. C. Electric Railway Co.—In December the company will hold its annual Christmas-gift campaign, in which dealers will be asked to cooperate through appropriate window displays, etc. January, annual clearance sale. The 1939 Cooperative Retail Dealers' Sales Plan will also be announced in January.

Colorado Central Power Co., Golden—November, campaigns on lighting and laundries. December, campaigns on appliances and lighting.

La Veta (Colo.) Light, Heat & Power Co.—November, lamp campaign. December, Christmas appliance campaign.

Los Angeles Bureau of Power & Light—December, Christmas appliance promotion. January, clearance sale.

New Mexico Public Utilities Corp., Gallup—November, light conditioning campaign. December, campaigns on home appliances and holiday lighting.

Pacific Power & Light Co.—In December the company will have gift-month specials.

Public Service Co. of Colorado—November, campaigns on IES lamps, washers and mixers. December, campaigns on IES lamps, mixers and small appliances.

Puget Sound Power & Light Co.—December and January, range and water heater campaigns.

Rocky Mountain Electrical League—Dec. 1-3 the league will hold its annual Jubilee and Electrical Exposition in Denver. The show will spark a series of similar shows throughout the league's territory. All will serve to point up present and pre-Christmas campaigns on appliances and IES lamps. Chief publicity items in the Denver show will be the use of Polaroid light to illuminate cellophane-clad bathing beauties, and a sun-bathing contest under sun-lamps. Instead of last year's pie-baking contest with electric roasters, there will be a venison roasting and broiling contest with roasters. Other features are being arranged by G. B. Buck, president of the Denver Electrical League; Ross H. Adams, exposition chairman, and George E. Lewis, manager of the RMEL. The show will be a prelude to the league's customary Christmas-lighting activity. Approximately 10,000 persons and $100,000 will support the show and connected campaigns. Territorial shows held by eleven of the league's thirteen local units will be timed to coincide as nearly as possible with the main exposition. All publicity will be handled through Denver.

San Diego Bureau of Radio & Electrical Appliances—Sixth annual electrical show will be held by the bureau in Balboa Park Nov. 29-Dec. 4. Doors will be open from 6 to 10 p.m. every day except Saturday and Sunday, when they will open at noon. The addition of the extra night (the show was of only five-days' duration in 1937) and elimination of the afternoon openings is calculated to increase attendance to 100,000. Advertising budget for the show is greater than the entire amount exhibitors will pay for space. Overhead lighting used extensively inside and out, and Christmas Tree Lane again featured. Special section devoted to lighting and wiring will be repeated. Number of prizes has been increased over last year. To stimulate interest in electric kitchens, a contest is being launched among students of high-school and junior-high-school age, who are to construct miniature model kitchens. Best ones will be awarded prizes and exhibited in the show. The bureau is also helping to promote an

intensive lighting campaign. Started Oct. 15 and continuing through Dec. 15, this drive is being pushed by more than 3,000 in. of newspaper advertising by incandescent-lamp manufacturers and San Diego Consolidated Gas & Electric Co. This month the utility is running a campaign enabling dealers to give away a free 100-watt lamp with a package purchase of lamps.

Southern Colorado Power Co.—November, light-conditioning and roaster campaigns. December, IES lamp, range and roaster campaigns. January, clearance sale.

Southwestern Public Service Co.—November, IES lamp and table cookery campaigns. December, IES lamp and roaster campaigns.

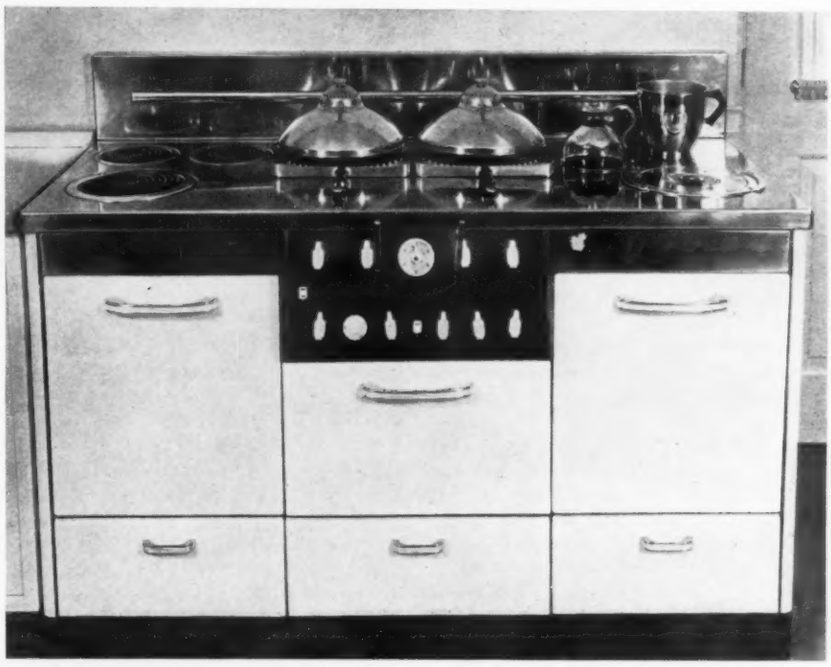
Utah Power & Light Co. and subsidiaries—December, campaigns on ranges, water heaters and Better Light-Better Sight. January, range and water heater campaigns.

Western Public Service Co.—November, campaigns on Mazda lamps and IES lamps. December, IES lamp campaign.

Washington Water Power Co.—Launched last month was a six-month light-conditioning campaign with the theme, "Light Condition With IES Better-Sight Lamps From Your Favorite Store." Quota set is over 10,000 lamps. The drive is divided into three periods: Oct. 3 to Nov. 26; Dec. 5 to Jan. 28; Feb. 6 to April 1. A feature of each period is the contest for the J.E.E. Royer "Sales Leadership" trophy, which will become the permanent property of the division achieving the greatest percentage of quota. Home-service advisers are assisting dealers in making light-conditioning surveys and recommendations to residential customers. More than 18,000 in. of advertising are scheduled for Inland Empire newspapers. Three radio stations are broadcasting ten light-conditioning programs per week. Other promotion consists of posters, window and counter displays, illuminated roof displays and direct-mail advertising.

Valley Electrical Supply Co. (San Joaquin Light & Power Corp.)—November, home lighting campaign. December, campaigns on lighting and Christmas appliances. During December the company will decorate its district offices so that customers will know they can buy appliances from dealers.

The Cookery Bar—A Single-Unit Kitchen



Of interest to the family or restaurant desirous of a compact, single-unit kitchen is the cookery bar designed and built by Frank E. Wolcott of the Silex Co. for use in his own home. Although it resembles a range, the cookery bar is actually much more, as shown above. Strip along back of range consists of concealed louvers, connected to the chimney flue which is equipped with a concealed exhaust fan, to remove surface odors and smoke. Visible broiling is made possible through the two table-height surface broilers in center. At right rear is a built-in mixer with the shaft exposed for easy changing of the mixing units. Between broilers and mixer is a glass coffee maker equipped with a control which keeps coffee at drinking temperature indefinitely. Beside regulation thrift cooker, in front of coffee maker is a two-slice toaster lowered so that the slots are flush with the top. Concealed behind right oven door is an automatic water heater

Association

Southern Californians revive retail group, elect McCall

Southern California Retail Electrical Assn., Ltd., has been revived as the result of dealer conferences held last year by the Electrical Development League of Southern California. Elected president was W. S. McCall.

Leo K. Allen was elected vice-president, and C. E. Price, secretary. Directors are J. W. Doan, K. S. Long, Ross McPherson, J. G. Conner, L. Clark, Allen L. Berry and S. A. Dinwiddie.

Committee chairmen are: A. G. Rea, membership; W. L. Schlegel, finance; H. H. VanHorn, rules; George H. Nicholson, publicity; John C. Holland, business ethics; Brad O'Donnell, meetings; H. R. Chapman, educational, and N. T. Lause, speakers.

Affiliation was made with the Retail Furniture Assn. by the appointment of Allen and Long to the furniture group's electrical appliance committee. Similar appointments to the gas appliance committee were also made. This affiliation permits the electrical association's use of the shoppers engaged by the furniture association for check-up on price maintenance under the Fair Trade Act.

The association, membership of which has now grown to 60, will establish special training courses for salesmen.

"Do You Like It?"

About a radio campaign held in San Diego

Just what radio listeners think about radio programs was the object of campaign-investigation made in San Diego last month by the Bureau of Radio & Electrical Appliances. First conceived as a means of bringing radio listeners to dealers' store to see new models, the drive was later expanded—and advertised—as a test of radio audiences.

When introduced at a dealers' meeting, the plan was greeted coolly. But eleven days after the investigation was announced, the public started flocking to radio-dealers' stores for questionnaires and radio-log cards. So great was this public enthusiasm that the 10,000 forms originally printed were immediately exhausted and a re-order was made.

Now dealers are very enthusiastic. They find they have a chance to talk with customers and prospects, discover what kind of radio they have and get an idea of why a certain type of program interests them.

The ballot was introduced by two 15-min. radio broadcasts a week. These were continued through the month. Twenty spot announcements were also run. The day following each major broadcast a large newspaper ad was published.

On the radio-broadcast program the audience was asked: "Do you like jazz? Do you like political talks?" etc. These questions, together with short samples of various kinds of programs, aroused interest. Some descriptive talk about radio broadcasting was also given.

Sale of new radios was pushed primarily by off-hand references. In an early newspaper ad, for example, a

note in one corner asked: "Are you getting the most out of it (radio entertainment) through the improved facilities of a modern instrument." In another corner, in slightly larger type, was a list of instructions on "How to Enjoy Your Radio." Introductory text said: "Radio offers hundreds of opportunities for the average person that could not be enjoyed excepting for radio. However, even those programs which please you most cannot be enjoyed to best advantage with an instrument which does not have the refinements of the strictly modern radio." These refinements were listed as push-button control, extreme selectivity, world-wide reception, reduced noise level, a larger musical range and new cabinet trend.

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Sales Shorts

Replacements; contest; ads, college colors; etc.

PORTLAND GENERAL ELECTRIC CO. has been killing two birds with one stone by persuading housewives to replace old, open-coil range units with new enclosed types. Not only do the new units afford greater customer satisfaction, but they also are less subject to damage and therefore reduce the frequency of service calls. Range service men are offered a small bonus for each unit sold; customers get a fair trade-in value on their old units. The campaign will continue to the end of the year.

●

SPONSORED BY Reddy Kilowatt is a "customer benefits contest" for utility employees. Thirteen prizes totaling $300 will be awarded for the best answer to the question "Why I Get My Power From a Power Company." Contest closes Dec. 10.

●

PUGET SOUND POWER & LIGHT CO. has seized on its recently signed contract with the Electric Home & Farm Authority to make friends of customers and dealers. Advertisements headed "Co-operating for a Greater Washington" read: ". . . The objective of the Authority is to have more people benefit from the use of more electricity. With such a wholesome purpose we are glad to co-operate—it's right down our alley. We want our customers to have maximum benefits from the maximum use of electricity, and of course we want to do everything possible to assist the dealers in our territory in selling more electrical appliances and equipment." The ad was signed by President Frank McLaughlin. A post-script said: " 'Puget Power is seeing to it that you get the most for your electric dollar."

●

ROCKY MOUNTAIN ELECTRICAL LEAGUE is covering every inch of the ground in its effort to condition the lighting of homes throughout its territory. One unusual feature of this drive is being made among college students by utilities and dealers. They are selling IES lamps bearing on their shades the school insignia and colors.

●

SEVENTEEN UTAH junior chambers of commerce now preparing Christmas lighting contests in their respective towns will compete this year for a loving cup presented by the Electrical League of Utah to the organization that does the outstanding job. The cup, which will carry the name of each year's winner, will be permanently held by the chamber winning the cup most frequently in a five-year period.

APPLIANCE SALES REPORT---SEPTEMBER 1938

A Summary of Dealer and Utility Reports Compiled by Associations, Societies, Bureaus, or Dealer Contact Departments of Utilities

REPORTING COMPANIES	Idaho Power Co.[1]		L. A. Bureau of P. & Lt.[2]		Montana Power Co.[3]		P. G. & E. Co.[4]		San Diego Cons. G. & E. Corp.[5]		San Joaquin Lt. & P. Corp.[6]		Southern Calif. Edison Co. Ltd.[7]		Utah Power & Lt. Co.[8]		Wash. Water Power Co.[9]	
	Current	9 Mos.	Current	9 Mos.	†Current	†9 Mos.	*Current	*8 Mos.	†Current	†9 Mos.	Current	9 Mos.	†Current	†9 Mos.	†Current	†8 Mos.	†Current	†8 Mos.
Ranges	426	3428	407	3535			345	2603			110	1068			231	1967	237	1534
Water Heaters	192	1665	106	1099			236	1599			59	496			63	647	195	1108
Air Heaters, aux.	32	215	60	551			206	2864			7	142			25	456	38	451
Air Heaters, 220			32	315			35	476			30	268						
Refrigerators	215	3689	3256	25432			3751	30324			202	4356			827	6131	493	5467
Dishwashers	4	17	13	197			8	99			1	52			3	28		5
Washers	275	2788	1924	14858			2643	18640			286	2325			747	5604	416	3267
Ironers	32	306	388	2892			530	3355			49	570			60	369	22	247
Vacuum Cleaners	31	686	565	4594			2088	15616			86	705			217	2705	203	1486
Radios	588	4769	3990	24716			8444	62342			449	3968			1097	8539	1054	7799
Mixers	25	402	199	1450			371	2517			44	363			309	1179	193	1172
Cookers, Casseroles	26	185	97	755							58	415			65	644	562	3578
Irons	370	3248	656	5468							311	2673			1631	7478	857	5340
Waffle Irons	68	823	166	1960							79	665			319	2131	172	1343
Toasters	122	1204									120	1081			530	2837	424	2889
Table Stoves	86	1478	241	1552							93	759			1252	5387	133	1279
Heating Pads	36	328	77	822							16	264			163	1229	98	797
Curling Irons															289	1413		
Coffee Makers	129	1280	144	763							134	1009			452	1870	412	3174
Sewing Machines	6	88					362	3645							110	1470	75	488
Clocks	62	671	288	1985							116	1205			350	1888	276	1817
Fans	66	1081	94	1168							23	1805			537	962	492	2842
Floor Polishers																		
Sun Lamps	10	61													4	62	3	40
Reflector Lamps	812	2892									244	1310			472	4984	533	7793
Miscellaneous Lamps	274	1348													894	5004	810	5621
Yard Lights											100	460						
Misc. Small Appl.			255	2164							73	820						

SOURCES

[1] Figures compiled by Electric Equipment Sales Association. Include power company sales of all reporting dealers.

[2] Compiled by Los Angeles Bureau of Power and Light for territory served by that system.

[3] Combined dealer and company sales from report of Montana Power Co.

† Does not include dealer figures for two divisions for January and February, 1938.

[4] P. G. & E. reports sales of major appliances only based on accurate reports from dealers' accounts. Ranges, water heaters and air heaters include company and dealer sales. *Due to delays in compiling report current and total figures are always one month behind those figures of companies reported in other columns of this table.

[5] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table: Miscellaneous figures includes fans, curling irons and sun lamps.

[6] Includes dealer reports from Midland Counties Public Service Corporation also. Compiled by Valley Electrical Supply Company.

[7] Includes reports from dealers on San Joaqin Valley system of company as well as Southern California areas served.

[8] Includes Utah Power & Light Company territory in Utah, Idaho and Wyoming. Also Western Colorado Power Company territory.

[9] Dealer sales only for Spokane and company territory. Company sales not included. Table stoves, grills included with cookers.

[10] September figures were not available at time of going to press.

ELECTRICAL WEST

Appliance Sales Guide

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It's Velvet

When you sell Table Cookery

Whether you make money or not selling table appliances depends upon your point of view. Table appliances can be "velvet" to your appliance business, or they can be something to decorate the shelves only. Nobody can afford to stock table appliances and not sell them. Therefore to get the potential profit out of them the subject is worth a little study. The problem is far more simple than most dealers realize. It is a matter of timing the punch and taking full advantage of the breaks that the utilities and manufacturers make for you.

What are the things in your favor?

1. Years of advertising and publicity by manufacturers and utilities and merchants to build acceptance and reduce resistance.

2. Big campaigns of consumer advertising in all the women's magazines.

3. Articles and pictures telling of appliance uses and virtues in women's magazines constantly.

4. Local campaigns at Christmas and in June, by your utility or cooperative league or society.

5 Speedier, automatic, and better looking merchandise to sell.

To the salesman table appliances likewise offer opportunities. They permit him to keep his dollar volume up to a consistent level and insure his job by bringing business to the dealer for whom he works. *Sales mean jobs.* That slogan speaks truth. And the salesman who can fill in with such sales otherwise dull times or seasons, or can sell a table appliance to a prospect not yet ready for a major appliance can be sure his job is secure.

The dealer must have producers in order to stay in business, and table appliances are a friend in need in many a case if the salesman will use his head, think quick, and offer a table appliance on its advantages at every chance.

In this Guide both salesman and dealer will find easy, practical, sales producing ideas to employ in making "velvet" out of table appliances. More elaborate schemes can be used by bigger stores, naturally, but even for elaborate promotions the basic selling method to bring results is boiled down for you here. Use it to advantage.

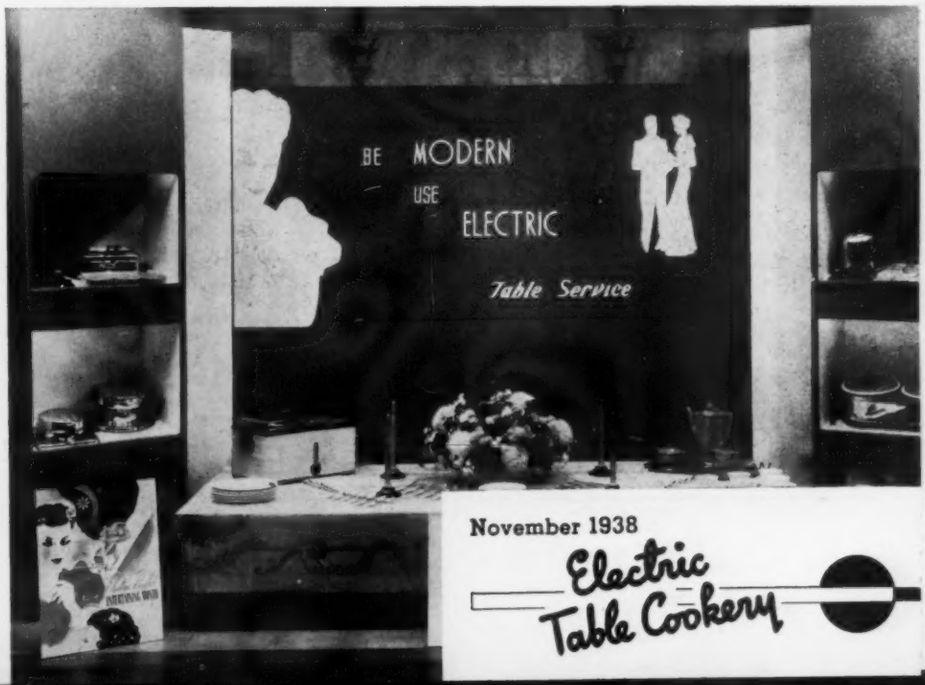
The Hostess Idea Makes More Sales

Most successful selling idea ever found to sell better grade table appliances instead of lower margin, cheaper grades has been the hostess idea. It lifts the table appliance up from mere utility to a plane of more gracious living, of entertaining friends more charmingly and yet with less bother. These benefits are worth more and can command a higher price; hence more profit.

It is simple enough to keep a dining or breakfast table tastefully arranged, with colorful tablecloth, napkins, colored dishes, accessories and the best grade appliances you stock. This table speaks more eloquently than any salesman, for it shows by example how a buffet meal can be served, how attractive it can be, how easy on the hostess to let her guests serve themselves while she joins them as one of the guests.

In holiday seasons, give the table a party atmosphere in keeping with the occasion—Hallowe'en, Thanksgiving, a football buffet party, Christmas or New Year's tables suggesting an easier way to serve the family and visitors than the backbreaking all day job of preparing a big dinner. In spring, a Valentine table, an Easter table, a June Bride table, are possibilities in the way of keeping that table alive and selling with a fresh inspiration to the shopper every time she sees it.

Print up or mimeograph simple buffet menus from the recipe books the manufacturers have available.



November 1938

Electric Table Cookery

. . . When the

IF anything makes table appliances slow movers today it is that too often they have to sell themselves to people who just walk through a store, so little selling is done on them. This is a mistake that is costing salesmen and merchants many a sale. To coast along on the momentum that the utility companies formerly gave to the sale of table appliances is to "let the old cat die" as children say when they want to slow down a swing. The swing to electric living utensils will also die down if there is no salesmanship push behind them. How to put such a push behind the sale of a better grade appliance than the cheapest in stock does not take much of a sales story. In one meaty sentence the added service that a better appliance can render can be told. In the following, just such sentences are suggested. Each one contains the word picture of added advantage that justifies a higher price. Use these quick, sales stimulating, appetite awakening descriptions to build up to a better sale.

Waffle iron—Now with this model you will not have failures; the automatic temperature control watches the heat for you and turns it off without a thought from you; a guarantee of perfect waffles, biscuits, cakes or other dainties every time. That's worth having, isn't it?

Sandwich toaster grill—With this well made grill you can be sure that every part receives even heat, producing a tastier, nicer looking, more appetizing morsel —and you know how that will make your reputation as a hostess. You would like a grill you could always rely upon, not only to look its best before company, but to perform perfectly, wouldn't you?

Automatic toaster—Everyone has his or her own preference in toast—light, medium or dark—soft or dry. What a relief to let the toaster worry about watching to see that you get it just as you like it! Just the peace of mind that comes with this toaster is worth more, isn't it?

Coffee makers and percolators—What a difference there is in reliability for just a little more! You appear to be a person who appreciates how little details, such as a longer lasting, easier-to-clean finish, more pleasing lines, more reliable means of heating, add to your pleasure, long after the small additional price is forgotten. It is assuring to know you have the best, don't you think?

Buffet warmer—What pride as a hostess, to be able to serve your guests second helpings as warm and tasty as the first, without necessity to rise from the table and leave your company, either! This is really an ornament to any table too, so well designed, isn't it?

Egg cookers—Breakfast without leaving the table—isn't that something to anticipate? And this little cooker knows just when to stop, giving you your eggs just as you like them every time. You can be proud of the appearance of your breakfast table with this attractive modern device to decorate it, too; this model with the matched egg cups, especially.

Each of the appliances you carry has individual selling features in addition to these. The same is true of a number of ingenious combination devices that do several cooking operations. Such catalog descriptive matter as this—"The special hinge keeps the upper part in a convenient position" does not mean much to a prospect until translated into what it means to her. Better far to tell her "You like a toasted sandwich that looks nice, that is not squeezed down on the side of the hinge, that is evenly baked throughout, don't you? This clever hinge arrangement makes that possible in this model, a little advantage that is really worth a good deal in your everyday use of this grill, don't you think?"

The first "catalog" statement leaves it up to the prospect to imagine what the feature means. The latter statement creates word pictures that leave no doubt in her mind as to what a "special hinge" means to her enjoyment of a perfect snack. Wise salesmen are those who lead their prospect to think of the benefits to be enjoyed from the use of the appliance, and hence to want it badly.

Prospect Says: "NO"

NO. 11 B
TABLE APPLIANCES

How to meet the usual objections—

When a prospect raises a resistance to buying, it is usually one of the following:

1. **"I wouldn't get use enough from it to make it worthwhile."**
2. **"They don't do a really satisfactory job."**
3. **"More trouble than they are worth."**
4. **"I have one now, but we seldom use it anymore."**
5. **"It costs too much to operate."**

Notice below how each of these **objections** are overbalanced with the **advantages**

1 **"Wouldn't use it enough?** I know how it might seem so. Yet have you thought of it as enabling you to save time and energy by serving really nice meals buffet style, informally; being a guest at your own party? It is a delightful way to serve without servants, makes such an attractive table, too. You save needless steps, cook just enough to suit the occasion, and serve it piping hot. No other sort of entertaining is so gay, so flexible, and I might say, economical too. Don't you visualize how nice this matched set would look in your home?"

2 **"Not satisfactory?** That's too bad. Possibly you've had experience only with some of the old-time non-automatic appliances. Remember how the old time automobiles were, always giving trouble too? When you consider that no watching and worrying is needed with these modern, better looking, automatic appliances, it is a shame not to take advantage of what they provide. They simplify meal planning, for much of it can be impromptu, right at the table. Steps to the kitchen are saved. You can cook just what you want as you serve it, etc."

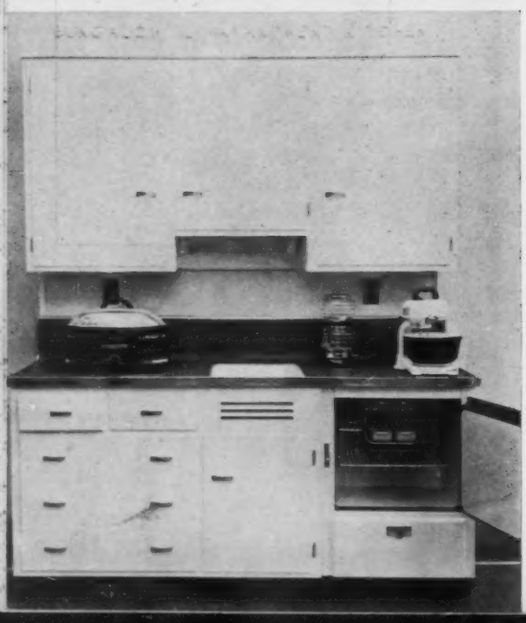
3 **"More trouble than they are worth?** That is frank, at least, and I like frankness. I imagine you are thinking of the necessity to take them out of closets to use, or of cleaning up afterwards. These new automatic appliances are good looking enough, don't you think, to stay right on the table, ready for instant use? That saves bother, and gives you the full usefulness of them for quick meals or snacks, time-saving breakfasts that are not skimped because of the rush. And with this new finish, they are clean in a jiffy. Automatic timing keeps things from burning and that helps too, etc."

4 **"You seldom use it anymore?** I can appreciate why that might be. The older models often were inconvenient in that they required so much attention. But those who swear by these better looking automatic newer appliances like them for the little extra things they have the appliance do for them. For instance, extra sleep of a morning after being out late, because it is no trick at all for husband to get a good breakfast himself, quickly. Then there are buffet suppers that are so popular and easy to prepare, and you can stay with your guests. There's the tea out on the verandah or in the garden in summer."

5 **"Costs too much to operate?** It must seem so, they are such luxuries, these modern automatic appliances. Yet the surprising thing is that their luxury is all in the satisfaction they give and not in their operating cost. We really enjoy low electric rates here in the West. It is surprising how little this costs to run. You can have waffles on this every morning for a month for only ——— cents.* That's hardly the cost of the syrup for them. Considering the years of daily service a quality appliance gives and the many purposes it fulfills, the cost is soon forgotten in the value received."

*Your utility can help you figure out the exact cost.

ROCKY MOUNTAIN ELECTRICAL LEAGUE • PORTLAND GENERAL ELECTRIC CO.
CALIFORNIA OREGON POWER CO. • WASHINGTON WATER POWER CO.



Matched Sets—

Few dealers and salesmen have cashed in on the "matched pattern" idea in table appliances to the extent this idea deserves. Those who have taken advantage of it have had excellent results, have sold a better grade of appliance, at a better margin, and made repeat customers.

Instead of displaying all toasters on one table—which confuses the buyer and tends to encourage "shopping"—arrange store and window displays of matched sets. When a customer asks to see a toaster, take her to a matched group. By selling the *pattern*, the purchaser is lifted away from *price*.

Often, to buy wedding or Christmas gifts, customers come in pairs or couples. By showing a matched set one customer may buy one appliance, the other customer a second appliance to match, and even send in another friend to complete the set.

Displaying—

Clean, simple, display helps to tell the passing prospect that "here is that appliance you saw in the women's magazines." It does not need to be either expensive or elaborate On this page, at the left, are a few sales making ideas. At the top is a window idea that permits small appliance display in any window, all the time, in conjunction with large displays behind them. A shelf, about 18 in. wide, along the entire window, makes a ledge on which small appliances can be put right close to the passing shopper, and gives them the appearance of being on a table. It is easy to keep such displays active by frequent change of arrangements, always a good idea in any man's store.

A demonstration center in the store, like that shown above, is always a producer. Action stops people to watch. That permits a chance to give them some of the sales points and to make sales.

Ways to keep small appliances active in a small store often have to be ingenious. At left is a plan used in many stores—glass shelves on adjustable supports along the wall with a lighted cove above for brilliance.

"Here it is"

is what you want to tell your community. The manufacturers have put millions into making people want their appliances.

Here is how

to steer that business into your store to buy from you.

To capitalize on the apartment house trade a model apartment appliance kitchen like that at the bottom of the page provokes sales. Sell from it as you would a range.

—Advertising

If you realize that most of your advertising has already been done for you, it will simplify your own and help you to direct yours to better effect. The combined national advertising of all reputable manufacturers is a backing of several million dollars annually. Its purpose is to create desire, and break down resistances for you. This limits your advertising need to just enough to tell the public of your town that to buy these well known brands they can come to your store. That is why it is smart business to identify your store with the well advertised brands you carry.

Most economical advertising is that which makes use of the folders, envelope stuffers, mat service and other advertising helps offered either free or at very low cost.

Many dealers do not appreciate that the most potent competition they have comes from dealers or selling organizations which are publicity minded and never fail to use every break to get publicity. To meet this competition a dealer should develop his publicity sense too, keep thinking of ways to remind the public that he is the one from whom to get the famous brand of appliances. To try to compete with such organizations on price is often suicide. Their buying power is too great an advantage. But with Fair Trade Acts you have an equal chance with anyone on the trademarked lines. More reason to tell the public that you carry these lines.

For a more individualized piece of advertising, get out a list of suggestions for Christmas gifts, graduating presents, June Bride gifts. To make that list help you to tell the sales idea, put a brief sentence of advantages after each suggested gift. For instance:

Casserole—

To serve hot dishes, attractively, right at the table.

Low-Cost Housing for Substations

By K. A. REEDER
Structural Engineer
Southern California Edison Co. Ltd.

LOW-COST housing is not a problem that's confined to the building of homes. Every utility has some equipment which must stay indoors. Such pieces of equipment require "Houses", and in building these the ideal combination of low cost and modern design is a constant goal.

The building which Southern California Edison Co. has just completed at Santa Monica for housing a non-attended distribution substation is a step toward that goal. Fig 2 testifies to its modernity. Its cost, exclusive of electrical work, was but $4.65 per sq. ft.

Santa Monica substation houses distribution circuit breakers, regulators, and attendant equipment, the transformers and high-side breakers being located immediately adjacent, outside. Supervisory control is from a station several miles away.

Gunite construction was the key to its low cost. While guniting is not new, its application to building construction is not widespread. At present, the absence of crews capable of this work may limit its application in some sections of the West. But it is probable that time will see facilities generally available for its use.

At Santa Monica substation, the entire structure above floor level was constructed of gunite. Plain forms were placed on the outsides of the walls, and the roof was formed completely. All reinforcement, including mesh, was placed, and guniting was commenced, walls being shot from the interior. Some details of the construction are shown in Fig. 3.

Insides of the walls were rodded and flash-coated. The roof was gunited as well. After seven days, wall forms were removed, ground wires were placed, and the cornice, quoins, architrave, etc., were gunited, and a flash coat was placed over the entire exterior surface.

Complete forming of the interior was originally specified, but the contractors adopted the foregoing method in preference. It is now believed that their method is the more economical, and it will be followed in any future installations of this type.

Walls are anchored to the foundations, and the walls and roof are well tied together. The building was designed to withstand seismic and wind loads, as required by the local building ordinance.

Proportions for the gunite were one part of cement to 4½ parts of sand, by dry weight.

Angle irons to support electrical equipment were attached directly to studs and joists by bolts which were cast in place. Because the building is non-attended, no lining was placed on the interior portions, and no insulation or air conditioning was employed. There are no windows. Ventilation is accomplished by louvres in the walls near the floor and roof ventilators.

As mentioned, contract price for the building, exclusive of electrical work, was $4.65 per sq. ft. Design was by the Edison Co., and the contract for construction was with the Macco Construction Co.

Another gunite structure recently completed by Edison is the Control House at Chino, the receiving substation for the Boulder-Chino transmission line. This building (Fig. 1) houses the switchboards, relays, and other facilities for operating equipment.

Trussed type steel studs were used for all walls, the exterior walls being

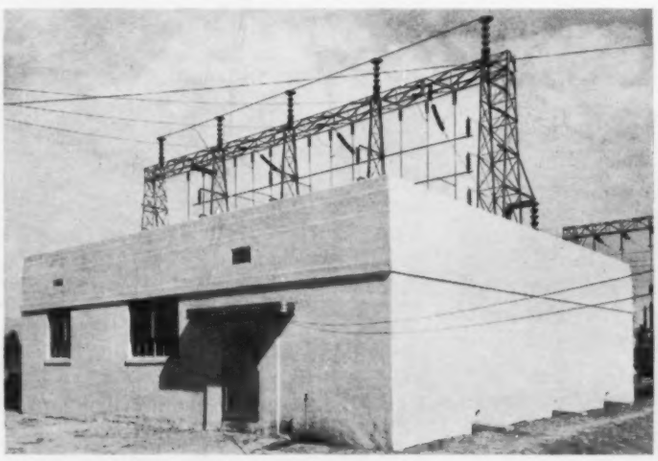


Fig. 1—(left) Chino control house, sprayed from the outside. Fig. 2—(right) Santa Monica substation, "shot" from the interior

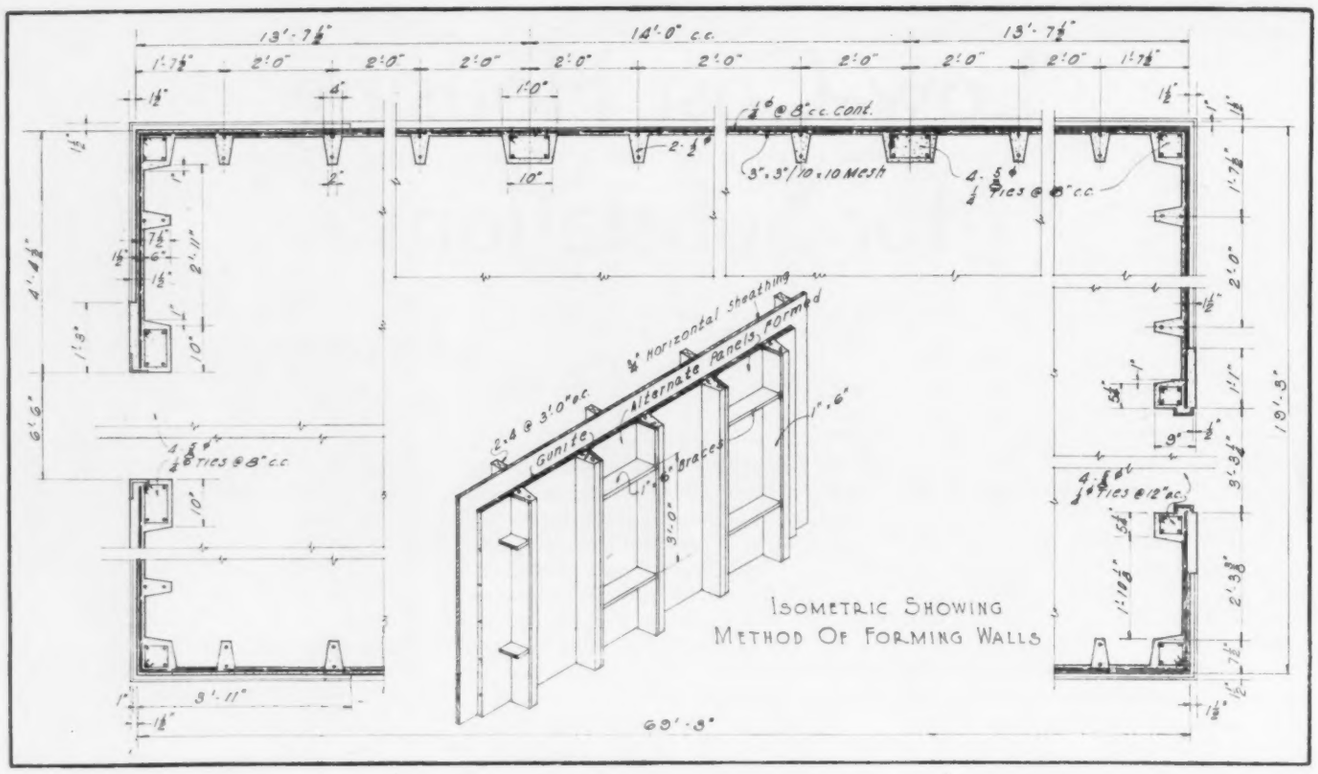


Fig. 3—Detailed partial plan of the Santa Monica substation

covered with ⅛x½-in. steel bars, placed diagonally at 45 deg., 13½ in. on center, and welded at all contact points to studs and plate tracks. This affords ample bracing of walls against lateral forces.

Welded galvanized wire mesh, 33-1010, weighing 3.6 lb. per sq. yd., was attached to lattice bars. Cardboard backing was placed ½ in. inside of bars, and gunite was shot from the outside to a thickness of 1½ in. Interior partitions and walls received metal lath and hardwall plaster.

The composition roof was laid on plank sheathing supported by trussed steel joists. The plank roof was designed as a diaphragm to transmit seismic forces or wind loads to the walls. The entire steel frame was applied.

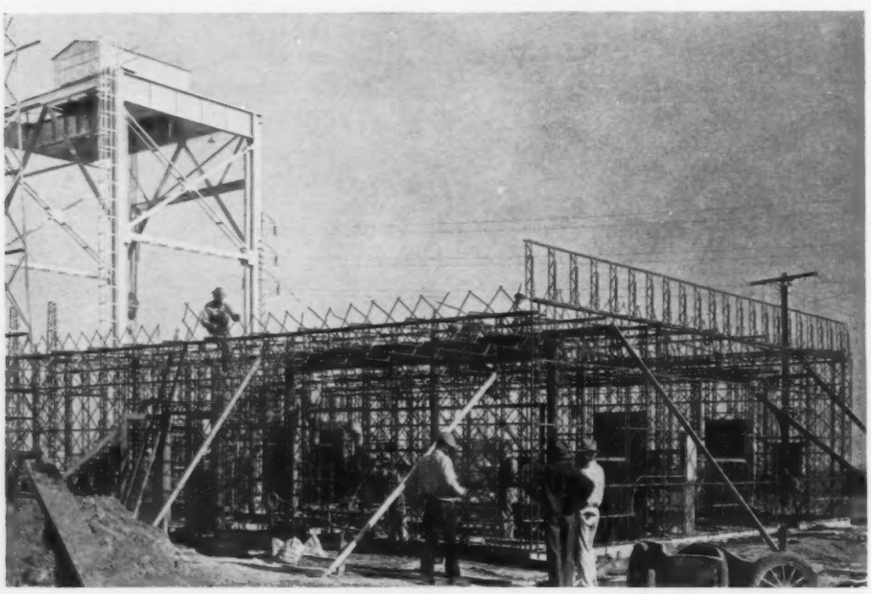
Apart from structural elements, considerable attention was given to insulation and air conditioning, the walls of the control room and the entire ceiling being insulated with mineral wool, and the composition roof being given two coats of aluminum paint. A refrigeration type of air-conditioning unit supplies cool air to the control room at the ceiling, the return being located at floor level. Provision is made for humidifying, filtering, and adding fresh air as required.

Acoustic plaster ceilings were furnished in the control and machine rooms. Special attention was given also to lighting of the control room, in order to avoid glare, especially in connection with meters on the switchboard. Flush type directional lighting in the ceiling was employed for this purpose.

Steel sash and hollow steel doors were installed. Floors are concrete, with a covering, in the control room, of asphalt tile. Contract price on this building, excluding electrical and air-conditioning work, was $6.10 per sq. ft. Contractors were C. T. and W. P. Stover.

Cost of these structures, particularly in the case of the distribution substation, has proved exceptionally low. At the same time, the attaining of a striking and attractive appearance has proved feasible with the gunite method. In view of these benefits, it is quite probable that the Santa Monica and Chino structures are examples of a method which may find increasing application by systems of the West.

Fig. 4—Steelwork under erection for the control house at Chino station



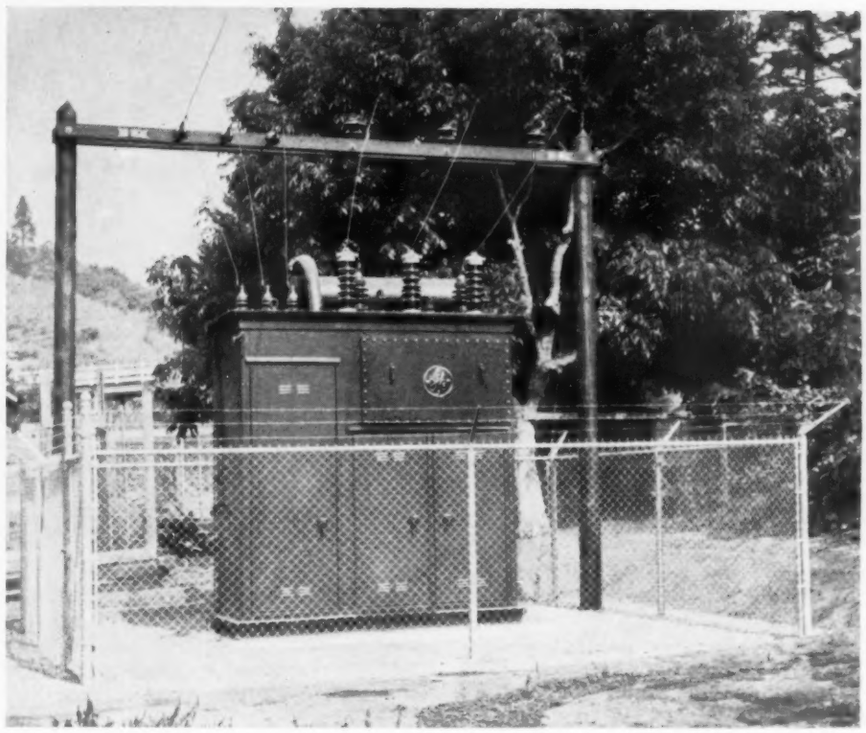


Fig. 1

Substation Installation, An Over-night Job

Coast Counties' crews take time out to put factory-type unit on line without interrupting construction schedule

THREE single-phase transformers and an assortment of accessories, having little co-ordination beyond that of being located in the same place, once represented the acme of distribution substation design. From the time it was first recognized that such combinations did not necessarily represent the ideal, a trend toward simplification has taken place. Over the same period, changing distribution practices have demanded smaller, more reliable units, incorporating better regulation and protection.

The Coast Counties Gas & Electric Co. substation installed this autumn at Felton, Calif., may prove significant in representing the culmination of this trend. It is a factory-built, single-circuit unit, which was delivered in on piece, ready for connection to the line.

Appearance Proves Value

One advantage of this unit became apparent even before its delivery. This was its appearance. As often happens, many landowners, visualizing an unsightly array of equipment in their neighborhood, were hesitant to part with any portion of their properties for power purposes. Coast Counties men found, however, that pictures of the proposed equipment and an explanation of its simplicity were exceedingly helpful in overcoming such objections. Using such pictures, it was possible to make satisfactory arrangement for purchase of property at the desired location.

This location is at Felton, in the midst of an area in the Santa Cruz mountains where load is largely that of summer residences and resorts. The station is fed through a single 22-kv. feeder and steps down to 4,260 volts for distribution to the area involved. Capacity is rated at 1,000 kva.

Total cost of the unit, excluding pole-mounted switches in the 22-kv. line, was about $12,000. This was about the same as that for the major items of the conventional substation—transformers, step voltage regulator and oil circuit breaker.

Cost Is Reduced

Savings, however, were achieved in these items: labor of installation, foundation, bus structure, bus wiring, fence and yard grating.

On the basis of an estimate for an equivalent standard substation, Coast Counties figures a 12-per-cent saving in the total cost, installed. Labor amounted to 2 per cent of the total cost, excluding land and the pole-mounted switches.

Savings in installation time represented a benefit in addition to economy. At the time this job had to be done, construction crews faced a full schedule of work. By purchasing a factory-assembled unit, it was possible to cut installation time to a minimum and thus complete the job without any serious interruption of construction schedules.

Smaller Foundation

For foundation, a simple concrete pad was poured, and the savings achieved in this respect were principally those incidental to its smaller dimensions. Overall dimensions of the unit are 10 ft. 2 in. by 7 ft. 6 in. by 13 ft. high.

Favoring low installation cost was proximity of the site to a railroad spur. The foundation having been completed prior to arrival of the unit, it was necessary only to unload the unit and skid it into place. Had it been vital to place it in service as quickly as possible, it is believed that complete installation could easily have been accomplished in a day. As it was, testing and checking which seemed desirable ran the time out to about two days—still but a fraction of normal for usual types.

Buswork Eliminated

Connections being within the unit,

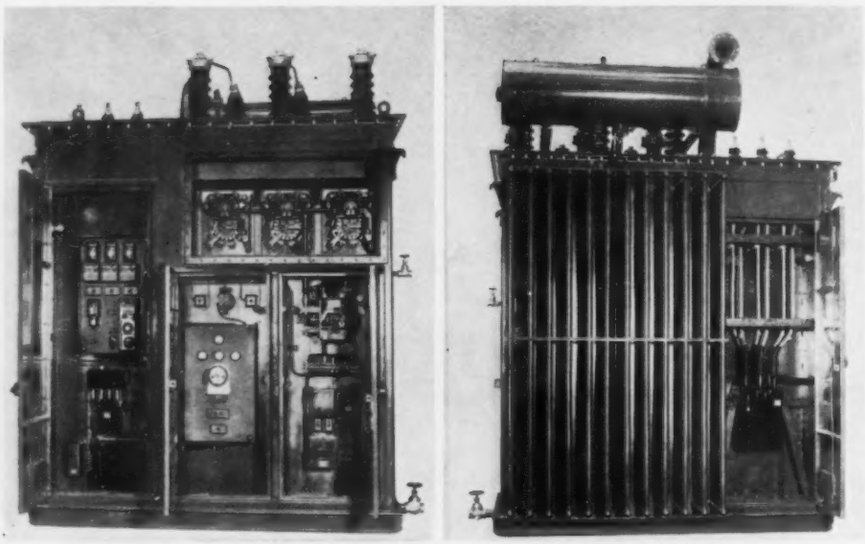


Fig. 2—Front and rear views of substation unit with compartment doors open

substation buswork is eliminated and wiring is minimized to making line connections. Possibilties of pole location were somewhat limited in the case in question, leading to use of the wood structure over the unit, as it appears in Fig. 1. Fig. 4 shows the pole arrangement, with 22 kv. feeder entering the station and 4,260-volt-Y distribution emerging.

Salvage Value

An obvious advantage cited in favor of this type of substation is its high salvage value. Should load develop in the area served contrary to expectation, the unit can be moved to another location with but the comparatively small loss of cost for original installation. At Felton, this was not considered to be a leading factor, as the load does not seem susceptible to rapid ichange. However, the advantage remains as a potential one.

The unit was furnished by General Electric Co., with transformer efficiency guaranteed at better than 98.7 per cent. Weights are: when untanking, 9,000 lb.; tank and fittings, 12,000 lb.; 1,160 gal. oil, 8,700 lb.; total, 29,700 lb.

The complete unit, appearance value of which has been referred to, is a rectangular container. Only bushings and lighting arresters are exposed on top, cooling tubes and oil conservator at the rear.

Arrangement of Parts

On the front and rear are doors, which open to give access to equipment which must read, adjusted or inspected.

The door at rear gives access to the circuit breaker proper, that at front left (Fig. 2) to the breaker-control compartment, carrying the control switch, reclosing relay, indication time overcurrent relays, indicator lights, solenoid reclosing mechanism, etc. The instrument panel is carried in the center compartment. At the right is the tap-changing compartment. This equipment includes the contact-making voltmeter, auxiliary relays, time-delay relay, line-drop compensator, control and selector switch, motor service switch and voltage testing studs, as well as the operating mechanism for the tap-changing equipment. Access to the ratio-adjuster contact assembly is obtained by removing a cover plate just above the two right hand doors.

Cooling tubes are mounted on the rear, and it is possible to secure a 25-per-cent increase in continuous capacity without exceeding normal operating temperatures by subsequent addition of a battery of outdoor fans to provide an up-blast of air around the tubes.

The tap-changing-under-load equipment provides for 10-per-cent regulation, and the circuit breaker—both integral parts of the unit—is rated 50,000 kva., 600 amp., 15,000 volts.

Assembly vs. Installation

A point sometimes raised in connection with factory-assembled units is that savings in cost of installation may merely be transferred to cost of assembling at the factory, so that a close comparison of costs—unit-type to conventional equipment—would show little difference. While there may be cases in which this argument holds true, the experience of Coast Counties, based on actual installed costs against close estimates of those for equivalent standard equipment, indicate an instance in which appreciable savings in initial cost were realized.

The Area Served

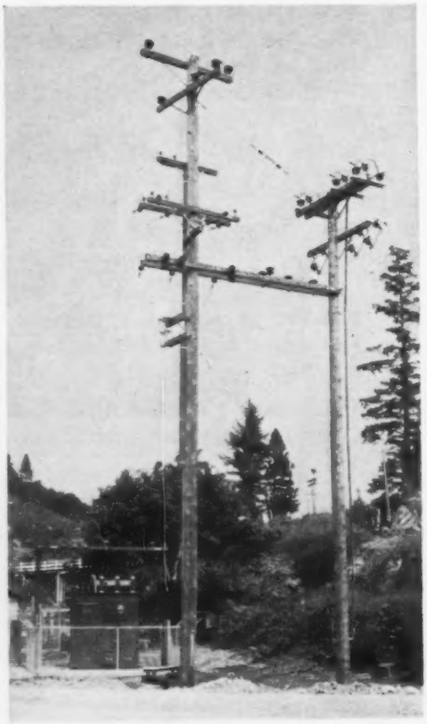
As has been pointed out: "A proper appraisal will not be obtained if consideration is given only to substation costs. It is necessary that consideration be given to total costs involved in serving a given area. This is true because the type of distribution system is also a factor. The economies of various types of distribution will be affected by the load densities served."*

This consideration should be applied in making any generalization from experience with the installation at Felton. It is also true that the general disadvantages of unit-type substations apply to this installation, such as the necessity for another source of supply when the unit station is subject to maintenance or repairs, inasmuch as the entire equipment must be removed from service.

What the Felton installation does represent is an instance in which a unit-type station has been installed under Western conditions with the realization of certain distinct advantages which were influential in leading to its selection.

These may be summarized as: lower first cost; minimum time of installation; lower core losses (over single-phase transformers); compact design and neat appearance; adaptability to air cooling, and high salvage value.

Fig. 3—Pole arrangement at substation



* "Unit-Type Substations" by John Bankus, Northwest Assn. Report, 1938.

CKVA

By C. R. BENSON
Transformer and Capacitor Specialist,
General Electric Co., San Francisco

Capacitors, Industrial and Other Uses—Second of Two Parts

(Central Stations, Continued)

Switching and Overcurrent Protection

Distribution fuse cutouts, because of their high speed inverse-time current characteristics, are preferable for overcurrent protection when applied in accordance with their voltage, current carrying and current interrupting rating. Where individual capacitors are installed at the distribution transformer, the normal fusing practice to prevent unnecessary blowing by surge currents (generally two to three times the full load current of the transformer) provides ample margins for the capacitor without increasing the rating of the fuse links.

Where banks of capacitors are connected across the line, the indicating and drop out fuse cutouts provide a quick and easy method for making sure the continuous benefits of the capacitor are being obtained. Fuse links above 75 amp. in rating should not be used, and the fuse link rating should be in the range of 165 to 235 per cent of the normal current of the capacitor equipment. This requirement must be taken into consideration in the application; for example, a 3-phase installation on a 2,300-volt delta circuit should not exceed 180 kva.

The limitations imposed above are the result of service experience and test—a fuse used with the capacitor equipment has two functions primarily; the first, the carrying of normal current; and the second, opening the circuit in case of fault.

In addition, when a capacitor is switched on to a circuit, a current surge occurs which may last from ¼ to ½ cycle and amounts to two to three times normal. This current surge will cause the blowing of a fuse when the cutout is closed, unless the fuse link is selected of high enough ampere carrying capacity. Although some utilities have used fuse links having a rating of 150 per cent of the normal capacitor current, it is recommended that the general practice be to use fuse links having a rating of 165 to 235 per cent of the normal current.

The fuse link should not be greater than 75 amp. If fuse links higher than 75 amp. are used, the energy on some systems which can be delivered to a faulty capacitor unit may be enough to disrupt the capacitor container. With the Pyranol capacitor unit a disrupted container would not prove particularly serious because of the non-inflammability of Pyranol. It is, however, desirable to protect against this possibility and, therefore, the recommendation that a maximum of 75-amp. fuse links be used.

Lightning Protection

While it is true that capacitance connected between line and ground will be effective to a certain degree in decreasing the slope of the impulse wave and also in reducing its maximum value, nevertheless the magnitude of the peak voltage and the length of the incident impulse wave are obviously beyond control. The substantial savings effected by the capacitors and their cost justify the small additional expenditure necessary for good lightning protection in territories where lightning is a problem.

Selection of Capacitors on Delta and Wye Systems

Three phase distribution systems are of several types:

1. Delta.
2. Three-wire WYE, neutral entirely ungrounded.
3. Three-wire WYE, neutral grounded to earth.
4. Four-wire WYE, neutral grounded only at substation ("Uni-grounded").
5. Four-wire neutral grounded at sub-station and also at individual transformers along the line ("Multi-grounded").

As far as the economic benefits to be obtained are concerned, it makes no difference whether the required amount of capacitive kva. is connected delta or Wye.

The application of Wye connected capacitors should be made only on grounded neutral systems of the 4-wire type, either "ungrounded" or "multi-grounded." It is obvious that under these two latter conditions, the neutral shift will be negligible.

There are circuits which are neither of the non-grounded nor the grounded type. Such a circuit would be as given in (3) above, that is, a 3-wire Wye circuit with its neutral grounded only at the sub-station. Wye connected capacitors on a circuit of this type could be used on circuits only where the ground resistance at the capacitor installation was low, that is, in the neighborhood of 15 ohms or less.

On voltages above 4 kv., the cost is not the same for delta or Wye-connected units and, therefore, cost is an important item and must be considered in determining the proper voltage rating of the unit. If the conditions outlined previously are met then Wye-connected units can be used satisfactorily. If not, then it is recommended that delta connected units be used in all cases.

Outdoor Pole-Type Capacitor Units

Capacitors for application on 460- and 575-volt circuits cost approximately $7 per kva. for the standard 15 kva. unit, either single or 3 phase. All of the benefits discussed previously for central station capacitors are, of course, available. These units have found particular application on 12-kv. feeder circuits where the load consists almost entirely of large 440-volt motors requiring a step down bank of transformers at each motor installation, the capacitors being connected on the 440-volt side of the step down transformer bank thereby reducing the kva. loading on this particular bank. In some cases it has been found that were it not for the addition of capacitors that it would have been necessary to increase the size of the transformer bank.

Capacitors are also available for 208- and 230-volt distribution circuits. The cost of these so-called secondary capacitors varies from approximately $17 per kva. for a 5 kva. unit to approximately $40 per kva. for a small unit such as ½ kva. Secondary capacitors to be uniformly effective must be located on the secondary of every transformer on the feeder. The average size of the transformer and the loading will, therefore, determine the average size capacitor required.

Although the secondary capacitor does offer some additional benefits as compared to capacitors connected to the primary side of the feeder circuit, on the average distribution circuit, it is generally found that the increased cost per kva. offsets any additional advantages. Space does not permit a more elaborate discussion of the application of 208- and 230-volt secondary capacitors, but as a general rule it is safe

to assume that the additional benefits do not warrant the additional expense.

An exception to this statement is occasionally found in the case of a low voltage network which is being overloaded because of the reactive kva. which is required by the many small motors and transformers, which the network may be supplying in addition to lighting and heating circuits. In this case, to provide additional capacity is very expensive and low voltage capacitors may provide an ideal and economic means of materially increasing the network capacity, because 5-kva. units can be used.

Series Capacitors

Capacitors for shunt application on central station feeders are used to offset the reactive kva. Series capacitors are, as the name implies, placed in series in the line and for an entirely different purpose.

Good voltage regulation is one of the fundamental measures of the quality of electric service. The voltage drop is due to the circuit impedance and on many circuits a major proportion of this impedance is reactance.

A shunt capacitor reduces the line current by offsetting the lagging current. A series capacitor is placed in series with the line and its duty is to nullify the effect of the line reactance by imposing a negative reactance, thereby improving voltage regulation. The application of a series capacitor has practically no effect on the power factor of a line.

The line current flowing through the series capacitor causes a voltage rise through the capacitor. This voltage rise offsetting the voltage drop across the line reactance. The line reactance being distributed, the voltage drop is thus distributed uniformly along the line. However, since the series capacitor must be located in one or two places, the voltage rise is, therefore, lumped in these locations.

For a given size series capacitor, the voltage rise is dependent only on the value of the line current. The voltage rise is, therefore, variable and depends only on the instantaneous value of the load. The effect of a series capacitor is, therefore, instantaneous in response to changes in line current.

The voltage correction being instantaneous, the series capacitor finds its greatest usefulness on circuits having large motors that are started and stopped at rather frequent intervals or rapidly varying loads of low power factor. Such loads are found in mine hoists, lumber mills, electric shovels, rolling mills, etc.

The series capacitor must be designed for a particular line and load. The capacitive reactance and the line current determines the size. The voltage of the line determining only the insulation required to ground. Because in general a series capacitor is designed for a particular job, it lacks the flexibility of other types of regulating equipment. Its one oustanding advantage over all other types is its ability to correct instantaneously voltage drops due to sudden changes in line current.

The series capacitor in effect is a negative reactance in the line offsetting the positive line reactance. Its most economical application, therefore, is on circuits having a high ratio of reactance to resistance.

Care must be taken in their application because the voltage rise across the capacitor appears on the load side. A customer located close to the capacitor would experience wide swings in voltage which might be objectionable. The ideal application would be a line unloaded except for industrial and domestic loading at the end.

Industrial Applications

Capacitors for industrial application are available from 230 volts to 13,200 volts in sizes from 0.5 kva. up. Large installations are made up using the required number of standard units mounted in a suitable rack, the standard unit being 5 kva. for 230 volts and 15 kva. for voltages of 460 and above. Since power rates and schedules vary so over the country, each industrial application must be analyzed in order to determine the economics of the capacitor installation. Generally the decision to purchase capacitors is based on the reduction in power costs which would result from installation.

There are, however, a number of other benefits which are not of so tangible a nature, but which are of real value. These are: (1) Increased transformer capacity. (2) Increased feeder capacity. (3) Decreased feeder losses. (4) Improved voltage regulation. (5) Improved operation of motors and associate industrial equipment due to improved voltage conditions.

If the customer is considering power costs alone, connection of capacitors on his side of the meter is sufficient. But if he aims to release transformer or feeder capacity, he must remember that a shunt connected capacitor forms a circuit through the generator, and that its corrective, leading current flows only through this, leaving equipment on the opposite side of the capacitor from the power source, and branch feeders anywhere, unaffected.

Copper losses vary with the square of the current (I^2R), and since the current is inversely proportional to the power factor, the losses are inversely proportional to the power factor squared. That is, if the power factor is raised from 70 to 90 per cent the losses are decreased in the ratio of $(70/90)^2$ or to 60 per cent of their original value. This reduction applies not only to the feeder circuits, but in the step down transformers if power is purchased at a primary voltage.

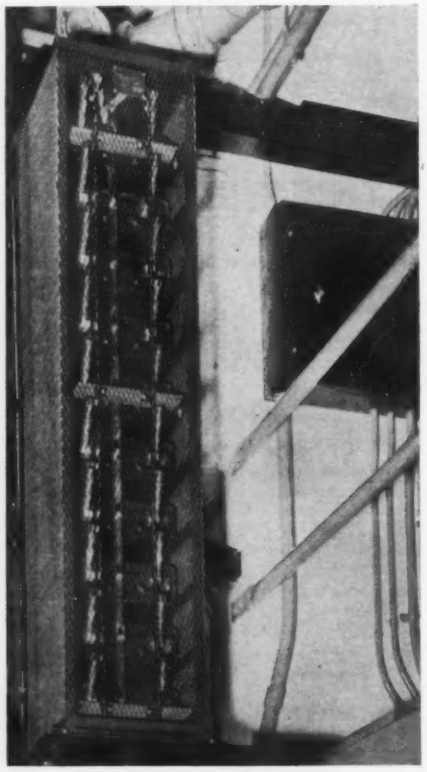
The following typical example of a power factor rate is taken from the P-15 schedule of the Pacific Gas and Electric Co.:

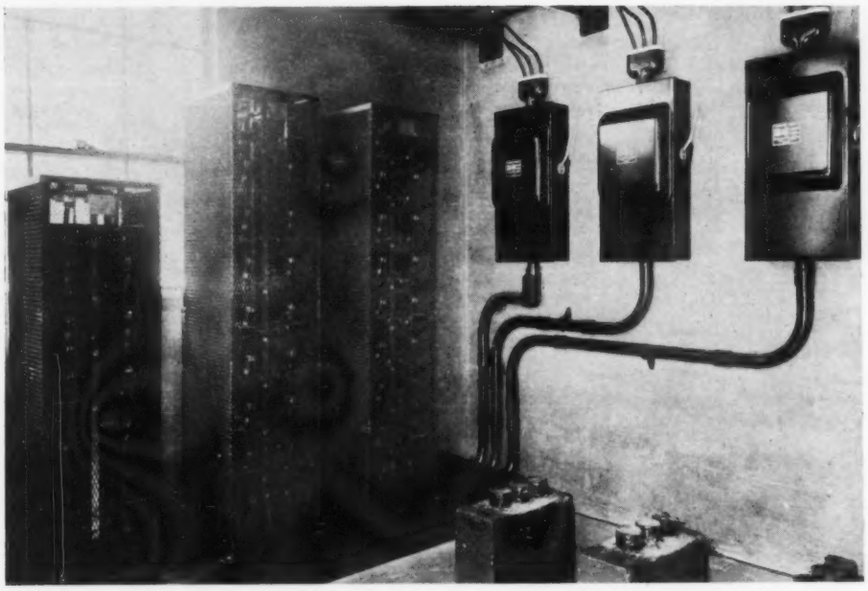
POWER FACTOR: When the billing demand has exceeded 300 kw. for 3 consecutive months and thereafter until it has fallen below 200 kw. for 12 consecutive months, charges for energy will be adjusted for weighted monthly average power factor as follows:

If the power factor exceeds 80 per cent bills shall be reduced by 0.3 per cent for each 1 per cent of such excess up to and including 90 per cent power factor, and by 0.2 per cent for each 1 per cent of such excess over 90 per cent power factor. If the power is less than 65 per cent, bills shall be increased by 0.5 per cent for each 1 per cent of such deficiency in power factor, provided that the maximum increase shall not exceed 5 per cent. In no case, however, shall the total charge, after adjustment for power factor, be less than the minimum charge.

For determining the weighted monthly average power factor for the purpose of this schedule a meter to measure the reactive kilovolt ampere-hours of the load shall be installed in conjunction with the kilowatt-hour meter. The power factor computed from the ratio of the monthly reactive kva.-hr. to the

Single rack of capacitors installed in a Western brewery





Three racks of capacitors which helped earn a better rate for Stauffer Chemical Co.

monthly kw.-hr. shall be computed to the nearest whole per cent. In any case, when the power factor is likely to be leading at any time, the reactive component may be ratcheted to prevent reversal.

Four factors usually determine the economics of improving power factor on the above schedule: (1) Present average power factor. (2) Average hours of plant operation per month. (3) Reactive kva. present when the plant is in operation. (4) Operating voltage within the plant.

The power factor is very important because as may be seen from the rate schedule, if the power factor is low (between 65 and 70 per cent) enough capacity must be installed to bring the power factor to 80 per cent before any bonus can be earned. This increases the investment required by a considerable amount.

The number of operating hours per month on a schedule such as the above often determines the economics of a capacitor installation. With the reactive kva.-hr. meter ratcheted, the capacitor can only be fully effective during normal operation. During the remaining hours the capacitor corrects only to unity power factor. If the reactive kva. is low during the off load periods, the capacitor is of practically no value during this period.

Many plants have considerable magnetizing current during off load hours. This may be due to underloaded motors operating around the plant or the exciting current taken by transformers.

Generally, a power factor survey should include an hourly check of the reactive kva. during full load and light or no load conditions. This may be done by installing a recording reactive kva. meter or by counting the disc revolutions of the rkva.-hour meter and calculating the rkva.

To find the amount of reactive kva. present at any particular time, it is necessary only to count the disc revolutions for a short length of time and then substitute in the following:

$$\text{rkva} = \frac{R \times K_h \times 3.6 \times C}{T}$$

where R = revolutions
K_h = watthour constant
C = product of the current and potential transformer ratio
T = Time of R revolutions in seconds

The rkva. at light or no load conditions can all be corrected for as this is a fixed value on 24 hours per day, seven days per week. Additional capacity can be added to correct the power factor to 93 or 94 per cent. The additional capacity over that required at no load or light load conditions can only be effective when the plant load is on and for this reason it is preferable to know the daily and weekly load cycles. Generally, 93 or 94 per cent is as high as it pays to carry correction because as much corrective capacity is requred to correct from 81 to 94 per cent as is required from 94 to 100 per cent.

Capacitors for straight 230-volt applications cost approximately 2¼ times as much per kva. as do 460- and 2,300-volt capacitors. The application is the same so the return on the investment is generally lower for 230-volt units. Sometimes a combination transformer and capacitor is used which, while it may decrease the initial cost, does have higher operating costs due to the transformer losses. A little study will show the economics of either type of installation.

Example of Industrial Application

The following example will show the possibilities of return due to the installation of capacitors at a typical industrial plant operating at 460 volts, 60 cycles, 3 phase.

From a representative power bill we have:

Kw-hr. = 120,000
Rkva.-hr. = 100,000

$$\frac{100{,}000}{120{,}000} = 0.833$$

This is equivalent to a power factor of 77 per cent.*

Power bill = $1,200

At 94 per cent power factor the ratio of rkva.-hours to kw-hr. is 0.363. That is, the reactive kva. hours must be corrected to 43,600—(120,000x0.363) or approximately 56,400 rkva. hours must be supplied by the capacitor.

In order to raise the power factor to 94 per cent, 150 kva. of capacitors were found to be needed.

The savings on the power cost per year, assuming this is a representative month, are:

(90 x 80) x 0.3 = 3 per cent
(94 - 90) x 0.2 = 0.8 per cent
Total = 3.8 per cent bonus

This is $45.60 per month or $548.00 per year.

A 150-kva., 460-volt, 3-phase, 60-cycle, small rack type capacitor with its individual switch would cost approximately $1,350 installed. This is a return of 40.5 per cent on the investment.

Savings in power cost through power factor improvement vary with each individual case. Return on the investment usually ranges from 0 to 50 or 60 per cent depending on nature of load and type of rate schedule.

Installation Practices

For maximum benefits capacitors should be installed as close to the load as possible. Generally, the capacitors are installed in banks of 60, 90 or 120 kva. around the plant because of the lower cost per kva. of capacitors in sizes 15 kva. and above.

Some industrials find that capacitors can economically be installed in small units located at the motor terminals because of the additional advantages obtained, such as lower losses, released feeder capacity and better operating conditions due to the improvement in voltage regulation because the feeder current is decreased.

Miscellaneous Capacitor Applications

Motors—Thousands of small motors are sold each year, each having a capac-

* 0.833 is the tangent of the angle whose cosine (that is, power factor) is 77 per cent.

itor. In some motors the capacitor is used only on starting. In other types of motors the capacitor is used both on starting and when running. In motors of this type two capacitors are generally used, one having a high microfarad capacity suitable for starting duty only, and the second unit suitable for continuous duty.

Capacitor motors on starting are somewhat equivalent to a 2-phase motor. High starting torque is obtained with a low value of starting current. Such characteristics, together with high efficiency are required for many types of installations.

Capacitors for capacitor-start motors are generally of the dry electrolytic type. The dry electrolytic type of capacitors can be built economically in high microfarad capacities for low voltage use.

Research during the past few years has continually improved the quality of capacitors for motor service, and at the same time has reduced the size. Where at one time the capacitor consisted of a unit almost as large as the motor for separate mounting or mounting on the motor, we now find in some cases the capacitor actually mounted within the end shields of the motor.

Neon Signs—Some utilities require power factor correction on all neon sign applications. Other utilities do not require power factor correction on small installations, but do on the larger ones.

The average neon sign transformer without power factor correction has a low power factor of approximately 50 per cent. This low power factor cannot be avoided because of the design characteristics of transformers for use with neon tubing requires a high reactance transformer.

Capacitors are used to correct the power factor. On new installations the capacitor is generally built into the transformer. The primary winding of the transformer is extended into an auto transformer to give a high voltage for the capacitor. This arrangement gives the most economical design because of the lower cost per kva. on capacitors 440 volts and above.

On old installations where the power factor must be improved, a combination auto transformer and capacitor are used built into a single case. The auto transformer steps up the supply voltage to a value permitting a more economical design. Standard combinations are available for 110-volts, 60 cycles from ¼ kva. to 7½ kva.

Direct Current Applications—Capacitors of all sizes and voltage ratings are used widely on d.c. work. They are used on rectifiers for filtering and for surge generators. In both these applications the use is rarely a pure d.c. one as considerably higher frequency a.c. components are present.

Capacitors of various ratings and types are used for radio application, in filter circuits, electronic circuits, high frequency by-pass circuits, tuning circuits, etc.

Capacitors are used in X-ray applications, especially in industrial equipments.

Miscellaneous A.C. Applications—(1) Power factor improvement of high frequency melting furnaces, usually 1,000 to 3,000 cycles.

(2) Lightning protection of rotating machinery connected to overhead lines. By their property of reducing the slope of a lightning wave front (low impedance to high frequency or transients), turn-to-turn stresses in rotating machines are reduced to a safe value.

(3) Coupling of high voltage lines to carrier current communications and relaying circuits. These coupling capacitors are available for circuits of all voltage ratings.

Other Applications—(1) Radio interference suppression on motors and small appliances. (2) Arc suppression on contacts to prolong the contact life. (3) Resonant relay circuits.

This article* has been an attempt to furnish a means of rapidly evaluating capacitor applications, either for industrials or central stations. It has attempted to present briefly some of the theory and point to the wide variety of applications where capacitors have an economic value.

* For detailed information on formula and estimating curves the reader's attention is directed to an article by Messrs. Gamble and Starr in the "General Electric Review" for October, 1936, and also to G-E Bulletin GEA-2746.

●

Capacitor for motor, such as refrigerator application, rated for intermittent use, 20 starts per hr., 3-sec. duration, 110 volts, 115 mf., in sealed aluminum container. Manufactured by Cornell-Dubilier

Not Plotted

Just as a couple of articles dealing with some very snappy looking Western substations were being put to press, this letter reached Electrical West:

Gentlemen:

I happen to be in the employ of a large western utility. I recently walked past a newly-built outdoor substation (which I thought was a pretty nice job) accompanied by an acquaintance who has no connection with the electrical industry.

"Why doesn't your company pay more attention to the appearance of its substations?" he asked. "Why can't they be made as attractive as service stations?"

Somewhat astonished, I replied that appearance was a prime consideration in designing a substation, and I thought we were doing fairly well.

"Look at that stuff," he said, pointing to a transformer bank. "Forget that it's somebody's brain child and contemplate it in a cold gray dawn. What is it? Some tanks with a lot of pipes running all around. Looks like a backyard distillery."

"Unfortunately," I defended, "we don't manufacture all that equipment. We buy most of it, and its design and appearance are determined by the manufacturers. Furthermore, much of it lasts for years, perhaps being moved from station to station. Sometimes, for economic reasons, we must place equipment purchased twenty years ago alongside some of the very latest."

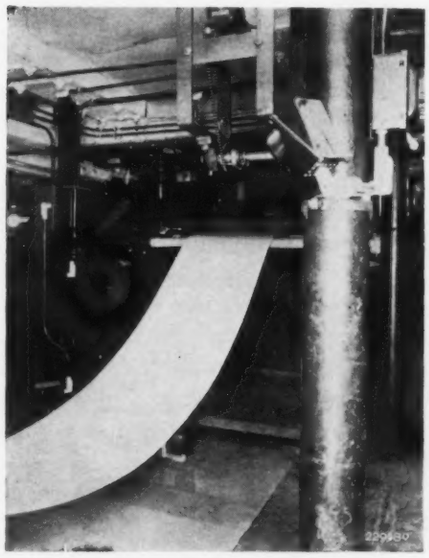
"Well, if I were a merchant and rented a store building with the architecture of twenty years ago, I'd have its face lifted the very first thing," he said. "And every five or six years I'd have things spruced up and modernized again. Everyone in the petroleum industry knows that the guts of a gasoline pump are no joy to behold, so they put 'em inside boxes that are nice to look at and easy to keep clean. That thing there is in the same class with the hand-cranked gasoline pumps of twenty years ago."

Being temporarily at a loss for a rejoinder, I resorted to the time-worn alibi that such improvements cost money.

"Sure they do," he promptly retaliated, "but what does your company do now? They spend good money for advertising, and lots of time and effort gaining the good will of the public. When they have to build a substation, they somehow manage to get permission from the city planning commission. Then they put up one of those pipefitter's dreams. . . . What's your answer to that?"

"I haven't any, I was forced to admit, "except that maybe some day somebody might write some manufacturer a letter about it, and he might bring out transformers and oil switches with lines to match his washing machines and ranges. But I think that day is still some distance in the future."

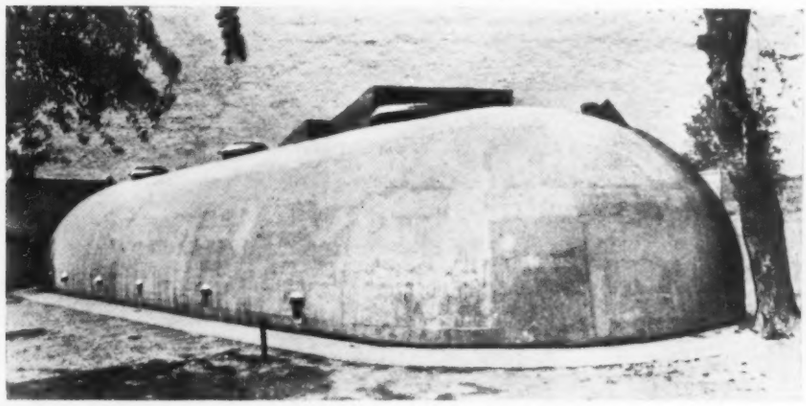
Maybe somebody did write the manufacturers a letter. The utilities too. For substations *can* be built which frighten no aesthetic person with their likeness to a "pipefitter's dream."



PAPER MACHINE SPEED is regulated in this Northwest plant by allowing shadow of the paper loop to interrupt beam of the column-mounted light, actuating photo-cell

"A Protected Sub-station"

Quite casually, "The Electrical Review," published in London, England, puts that title over an article in its Oct. 7 issue dealing with the substation pictured here. To the English engineer, protection can mean more than one thing. The article says: "What is probably the first bomb-proof substation in this country was opened on Monday last at Watford . . . to afford protection against air raids, the building is proof against splinters from high explosive bombs, incendiary bombs and gas . . . The walls are of heavy steel-reinforced concrete, being 2 ft. thick up to a point a foot above ground, gradually falling off to 6 in. thick at the top." It houses three 500 kva., 6,600-350/200-volt transformers and switchgear. All cables are underground



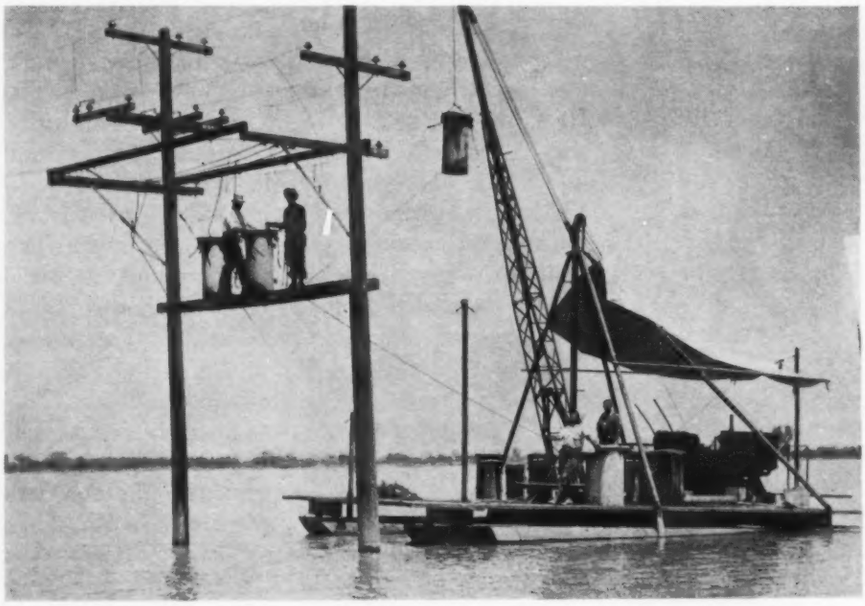
San Joaquin System Uses Barge Effectively to Salvage $20,000 Worth of Transformers from Flooded Zone

Floods covering 230 sq. mi. adjacent to Tulare Lake, this fall forced San Joaquin Light & Power to remove some $20,000 worth of distribution transformers. The barge, shown below, was designed by the company, but built by a second party and rented. This scheme seemed most economical as other interests near the flood region would need such equipment.

Measuring 24x30 ft., it is supported by six 24-in. legnthwise pipes, powered with a 30-hp. tractor through a propeller. Rental was $4.25 per hr., including operator and fuel.

Previous load was largely irrigation pumping, which presumably will not be restored for several years. Cost of removing 118 transformers, 25 or 37½ kva., was about $2,000.

CORE-WINDING, a step in the manufacture of a wound-core transformer, new General Electric product, is shown at right. Cores are pre-wound, then assembled around coils with this machine, reproducing the original spiral



ASCE Proceedings Deal With Power

Many power men may have occasion to refer to a paper and a discussion which are included in the October 1938, *Proceedings* of the American Society of Civil Engineers.

"Energy Mass Diagrams for Power Studies" is the title of the paper, John W. Hackney, assistant hydro engineer, Aluminum Co. of America, the author. His work is described as "a method of applying the mass-diagram principle to complex hydro-electric power generation systems."

"Cost of Energy Generation—Second Symposium on Power Costs" is the subject of discussion. Eighteen authorities contribute to this follow-up on the symposium which originally appeared in *Proceedings* of April 1938.

EDITORIAL

Sell What You Demonstrate

HIGH praise is due the power companies for the fine examples they set in their offices and other buildings for adequate and efficient use of the service they have to sell. No finer demonstrations can be found of commercial lighting, air conditioning or appliance displays. Here are places where the utility salesman, the contractor and the dealer can show prospects installations worthy of emulation.

Unfortunately, however, there are instances where the salesmanship does not measure up to the perfection of these installations. Cases may be cited where the utility lighting salesman, in his zeal to secure added load, advocates low-priced inadequate fixtures or even recommends the installation of over-wattage lamps in various types of fixtures. Obviously this is not deliberate. Where the customer has only so much money to spend, the salesman wants to give him the most light and secure the greatest possible load.

There is no necessity for calling attention to the dangers involved in practicing one kind of doctrine and preaching something else. The advantages of selling quality lighting and laying out and recommending installations that measure up in every respect to those which the utility selects for its own use are perfectly obvious. Only when this is done does the whole industry, and the customer as well, derive all of the benefits from electric service.

Bright Skies

FACTS not fantasies are behind the generally pervading spirit of optimism which has taken hold of the electrical industry here in the West during recent weeks. Favorable indeed is the future outlook as reflected by a wide variety of events and opinions. Here are just a few of them:

Power production in the Pacific Coast states now exceeds last year's levels and these increases promise to continue. Voters are finding less appeal in proposals for government ownership as indicated in recent elections in all parts of the territory. Utility public relations are better than ever before. The diminishing popularity of "yardstick" theories is reflected in the changing attitude of administration power spokesmen. Predictions are that the program of national defense may involve utility construction expenditures to the extent of $1,000,000,000.

On the commercial front appliance sales also are turning upward. Here in the West domestic energy sales are 6 to 10 per cent ahead of last year. At the same time average rates continue downward. At no time has the public been offered better bargains, both in appliances and in service, than can be obtained in the electrical market today. Residential building continues to gain and the adequate wiring story is having a salutory effect upon the business of the contractor.

All of these facts spell opportunity to cash in on the cumulative effect of the hard work which has been done by the industry during recent years without much tangible return.

Public Relations at Work

"WHAT difference does it make to me if the company's public relations are good or bad?" An employee—one of the rank and file whose job might have been driving a truck, or climbing poles, or pulling wire—asked this question recently after listening to a talk on the desirability of good public relations. There must be thousands of workers of the same frame of mind in the industry. And they deserve an answer.

Here are a few personal advantages of working for a company whose standing with its own people, its customers and its community is high: Satisfaction in knowing that the "outfit I work for is right." Pride in a job which represents an individual contribution to the overall service to the community. Respect of friends and fellows for working with an organization that is well thought of by the whole community. Enjoyment and pleasure from being associated with a reputable and respected organization.

These may sound like platitudes. However, here is concrete evidence of how they work. Grays Harbor Railway and Light Co. was faced with a power district election. Without urging, without knowledge of the management, more than 100 of the employees met and organized themselves into a working committee to oppose the measure. These people discussed the proposed public power venture as it related to their jobs. They were aggravated by the statements, misstatements and misinformation which were being offered the public as facts about their company and their industry. They were motivated by pride in their industry and their company and the desire to protect both.

So they appointed their own committees and outlined their own campaign of opposition. They prepared data for their own information and to be used in informing their friends, the company's

customers and the voting public as a whole. They directed their efforts toward enlightening the taxpayers, the newspapers and the operators of the local radio station.

Obviously these rank and file employees knew the value of good public relations. They were proud of their jobs, their industry and their company. Their group action, uninspired and unpremeditated, is a forthright example of how living up to the three-part definition of public relations as stated in our last issue pays dividends.

The Wireman

WHETHER it has been because, perforce, he belonged to a union, or because he worked with the tools, or for any other reason not even tangibly realized, the wireman employed by the contractor has been a neglected potential salesman for the electrical industry. As long as he continues to be so neglected he is more apt to be, shortsightedly, a hindrance rather than a help toward greater electrification. Now with the industry finally aroused to the need of wiring and the sheer necessity for selling it, perhaps it may be realized that unless the man with the tools is enthusiastic in his attitude toward adequate wiring he will not help the movement in that direction.

Working on the job, the wireman often is engaged in conversation by the owner or by prospective home-owners. When his advice is asked and he belittles the need of wiring, he not only deprives himself of profitable work, but he also spoils the industry's chances of selling more products and electricity and the owner's enjoyment of full use of his home. On the other hand, a friendly suggestion about additional outlets, or switch control, or electric equipment helps everyone, including the wireman and the home-owner.

There is another angle, too, that should impel the industry to forget any of its previous snobbishness and go to the wireman with a self-interest story which will enlist his cooperation. Future contractors probably will rise out of the ranks of the present wiremen and apprentices. If they start business with the suspicious, defensive, class-conscious attitude inculcated in many who have entered contracting, the industry will be held back by a crop of contractors who have no sales view point and who know only one way to get work for themselves—by cutting the price and the adequacy.

Psychologically, it has not been very intelligent to ignore the wireman, and as a result he has graduated into contracting as an orphan stepchild. It has given him an inferiority complex that finds its outlet subversively in antagonism toward big business and successful enterprise. Until the industry adopts the attitude of expecting more of the wireman, and of making him feel that he is part of the sales force that keeps the industry growing, it will not capitalize upon the potential help that this skilled hand-worker can render in promoting the fullest use of electricity.

If this be treason, it is too bad, for it also happens to be true.

ELECTRICAL WEST

DEVOTED TO THE ECONOMIC PRODUCTION, TRANSMISSION AND DISTRIBUTION OF ELECTRIC POWER AND ITS APPLICATION TO INDUSTRY, COMMERCE, AGRICULTURE AND HOME IN THE PACIFIC EMPIRE, AND TO THE MARKETING OF EQUIPMENT AND APPLIANCES AND OTHER UTILIZATION DEVICES IN THAT AREA

Indigestion

IN the "Ham and Eggs" or "$30 Every Thursday" scheme presented to California voters in the November election is to be found a perfect example of socialistic indigestion. Among the interesting things about the proposal is that those fighting against it most bitterly were municipal-utility employees. They, along with the school teachers and other state and municipal workers were threatened with the pains which are typical of indigestion.

Why indigestion? Because the situation was like the case of the little boy who ate too many pies. The first tasted so good that he ate another, and then another until he had consumed several. Then nature took its course and the little boy was not at all happy.

For several years communities have been tempted with the pie of more government in business, more socialism in one guise or another. It all tastes good as it goes down, and the result has been an increasingly greater proportion of the population dependent upon governmental enterprises for its livelihood.

Along comes a hare-brained scheme like the "$30 every Thursday" program, and its promoters, in order to give it a talking point and some claim to responsibility, incorporate into it the proposal that half of the salaries of municipal and state employees be paid in scrip. This is more pie to the voters, but it is a headache—the kind that forewarns of more internal distress to the state and municipal employees. Even worse, some analysts predict the ultimate annihilation of municipal utilities by bankruptcy should the measure pass.

Unfortunately the voting public has not yet realized that the private utilities were not crying "wolf" when they warned of the creeping spread of socialism that would soon be felt by everybody, whether electricity was his business or not.

At the conclaves of the PCEA—Clyde Huston, left, chairman at the Los Angeles luncheon: President A. E. Hitchner, at the San Francisco luncheon; Lane D. Webber speaks at Hollywood on the dangerous legislation on November ballot

PCEA Conclaves

Study ways of correlating the actions of the various branches of the electrical industry

Not spectacular on the surface but exceedingly practical and more than ordinarily promising of results, the two fall conclaves of the Pacific Coast Electrical Assn. were held late in September and early October. First came the San Francisco conclave, at the Fairmont, Sept. 29, 30, 1938; then a week later the Hollywood conclave, at the Roosevelt, Oct. 6, 7. A. E. Hitchner, Westinghouse Electric & Manufacturing Co., Los Angeles, president of P. C. E. A., presided over both. Chairmen and vice chairmen of the Operating-Economics, the Business Development, and the Administrative Services Sections, chosen to represent both ends of the territory, usually participated in both conclaves.

Real work of the conclaves was accomplished in a number of group discussion meetings—not committees—which met in informal discussion to explore any industry problem needing attention and to make recommendations to the board of directors for action at the latter's meeting in Los Angeles, Oct. 20. The cross fire of discussion had a way of eliminating all but the vital and pertinent subjects, yet satisfying all who participated that no idea or viewpoint had been overlooked.

The subjects covered embraced interests of every branch of the industry. Some will be studied further and action taken upon them to improve the business, the relations, or the methods of the industry. In his opening remarks at each conclave President Hitchner emphasized the new nature of the association, said its purpose would be to correlate the actions of the various organizations which serve each branch of the industry individually, and seek concrete and definite ways in which matters of mutual interest may be handled.

As a more spectacular conclusion to each conclave, and to bring all three Sections into a single meeting, the final luncheon was addressed by speakers who drew attention to measures on the California ballot in November which held potential ruin for that state and the industry. M. D. Lack, tax counsel, Pacific Gas and Electric Co., addressed the San Francisco meeting; Lane D. Webber, counsel, Southern California Edison Co., that in Hollywood. In addition to these speakers, Dr. Phillips Thomas of Westinghouse research laboratories gave his lecture demonstration at Hollywood, and Dr. F. P. Woellner, professor of education, University of California at Los Angeles, gave one of his inspiring and humorous talks to the San Francisco meeting.

In the midst of the European crisis at that moment, Dr. Woellner advised Americans to be concerned, certainly, but to be more concerned with some crises at home, which he named as (1) soil—learning better to use it so that it shall not be exhausted; (2) population—to encourage more breeding at the top of the intellectual scale and less at the bottom; (3) capitalism—clean up its few deficiencies because it really is the superior form of economy, produces more, at less cost, for more people than any other system; (4) government—make it reflect our economy more, instead of lighting it; and (5) morality—return to the building of character and integrity, for without them there can be neither peace nor progress—only chaos.

Each of the Sections wound up its own meetings in a general session also. The Operating-Economics Section met to consider occupational segregation and improvement—in other words, promotion and classification of personnel. In Los Angeles J. F. Davenport, chairman of the section, presided; in San Francisco, A. C. Jones, vice chairman, had charge. Similarly the Administrative Services Section, A. D. Church, chairman, and G. C. Delvaille, vice chairman, held a joint session of all groups on the final morning of the conclave to hear a report from each of the discussion group leaders.

The Business Development Section, however, staged a miniature sales conclave of its own at each conclave. At San Francisco, Friday morning, with Al Nicoll acting as chairman for Section Chairman R. J. Holtermann, a three-part program was held. Leo Gianini, Incandescent Lamp Dept., General Electric Co., gave an analysis of the effects of fluorescent lighting on control station load. He predicted increases of usage would more than return revenue lost because of the more efficient light source. D. S. Manuel of F. H. A. described the markets for electrical equipment and wiring made possible by the building and modernization financing under F.H.A. San Jose division, P. G. & E. Co., staged a two-act playlet, written by Emmet Brittain, showing the wrong and the right way to sell Red Seal wiring.

At Hollywood W. E. Cranston, vice chairman, conducted a similar meeting on the roof of the hotel. A. T. Danielson, sales manager of Barker Bros., described how his crew self-governs itself in an interesting method by democratic cooperation. He declared that the danger today is that regimentation will kill salesmanship, saying that "the only live, pulsating thing in business today is selling." F. O. Harris gave a challenging talk, outlined the business possibilities in the F.H.A. program that is still offering loans for modernizing until April, providing financing for new homes, starting some large scale housing projects, and will soon insure farm mortgages where a dwelling is involved. The hardest job, he said, has been to sell those who benefit most in a business way and to get them to do something with their opportunities. Harry Simmons, sales counsellor, gave an inspirational talk on "the 10 commandments of selling."

A separate committee of the associa-

tion spent several productive hours developing ideas for the series of regional meetings of the P. C. E. A. to be held in 10 cities during the months of November, January, February and March. A program of more direct interest to every member of the P. C. E. A., as well as to those in the industry who attend these meetings, has also been constructed.

This program comprises ten regional meetings for the near future, and more are in prospect as part of a program of taking the association out into the field to its membership. Sponsored by the industry information committee under R. E. Smith of Southern California Edison Co., the meetings are set as follows: Visalia, Nov. 14; Riverside, Dec. 2; Sacramento, Jan. 17; Sonoma, Jan. 18; San Jose, Jan. 19; Santa Cruz, Jan. 20, and Santa Barbara, Jan. 27.

A three-part program is planned for each meeting. First talk—on the subject, "What Is the Electrical Industry?"—will be delivered by a utility executive. Second will be a "cash register" presentation on electrical-market opportunities. An inspirational message will conclude the program.

Many concrete suggestions came out of the two conclaves which requested the PCEA directors to establish special committees to conduct investigations. The Operating Economics Section outlined plans for the Spring Conclave in Fresno and requested that the board urge member companies to permit full attendance. This section also requested that future plans provide for interchange of geographical representation between the northern and southern conclaves.

The board authorized the following committee studies to be made by the Administrative Services Section: an investigation of the member company practices regarding rental of employees' automobiles and the plan of reimbursement; a study of centralization vs. decentralization of maintenance of automotive equipment; a committee investigation of such accounting practices as uniformity of customer deposits, cooperation between companies on following up collection of delinquent accounts, exchange of credit information, shut-off policies, re-connection charges, and time payment contracts; and completion of the report of the committee investigating customer relations audit together with a study of the cost per customer contact.

Authorization was also granted this section for the formation of a woman's discussion group which would include the work formerly accomplished under the Women's Committee.

Included among the projects approved for study by the Business Development Section were the following: formation of a joint committee with the Red Seal Committee to promulgate specifications and circularize the industry on the desirability of installing a duplex convenience outlet for providing light and time service to gas ranges so that an electric oven may be employed; appointment of a similar joint committee to investigate the standardization of customer service facilities into three groups depending upon the size of residence served; appointment of a special PCEA committee to maintain contact with the Petroleum Institute and the oil industry; appointment of a committee to revise the power sales handbook; appointment of a joint committee with the Operating Economics Section to study load and diversity factors of various domestic appliances; appointment of a joint committee to work with the Red Seal Committee to revise the Red Seal commercial wiring standards. Purchase of a school lighting demonstration kit to be used in promoting better school lighting was also authorized.

The board also passed a resolution endorsing the work of the Western Institute of Light and Vision and the Sight Conservation Council of Northern California. A second resolution endorsed industry representation in the Palace of Electricity at the Golden Gate International Exposition.

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Northwestern

Section, IAEI, meets in Spokane. Changes in National Electric Code dominate session

Concentrated work on whipping recommended changes in the National Electric Code into shape for presentation to the electrical committee dominated the business sessions of the twelfth annual meeting of the Northwestern Section, International Assn. of Electrical Inspectors at Spokane, Oct. 3-6. An occasional breathing spell was afforded, however, in order to allow for the presentation of informative papers and moving pictures and for the enjoyment of extra-business activities.

E. B. Morrison, assistant electrical engineer with the Oregon Insurance Rating Bureau of Portland and president of the Northwestern Section, presided over the two-and-a-half days of business. H. C. Swann, chief electrical inspector, Spokane, headed the committee handling convention arrangements.

Many of the reports of the article committees, as supplemented or amended by the report of the code clearing house committee, went through the convention with little discussion. A few, however, stirred up controversy. Notable in this respect was the report of the Article 210 committee. Arguments about this report, presented by L. W. Going, chief electrical inspector, Portland, arose over multi-wire branch circuits, tap conductors, multi-outlet assemblies, determination of circuits, division of load and receptacle outlets.

The Code Breakfast, presided over by W. R. Volheye, chief electrical inspector for Oregon, centered round the use of the phrase "special permission" in several articles of the code. Consensus was that use of this term made work easy for the electrical committee but difficult for enforcing authorities, and that it brought into question the legality of the code for adoption in a municipal ordinance. These ideas were embodied in a resolution asking the chairman of the electrical committee to bring this objection to the attention of the national article committees with a view toward eliminating this phrase and making the code definite and specific on all points.

Chester M. Kirsop, new president of the Northwestern Section, IAEI. Kirsop was first employed by A. G. Electric & Mfg. Co. In 1914, while working for Pacific Tel. & Tel., he entered the college of engineering, University of Washington. After the war he worked in Seattle, then went to Olympia, Wash., where he helped install electrical work on the capitol group. Later he was in the general electrical contracting and interior wiring business. In 1927 he was appointed city electrician and electrical inspector. Except for a time in 1930, when he studied at the Coast Artillery Electrical School at Fort Monroe, Va., he has held his inspection position in Olympia ever since

Other resolutions endorsed the program of the National Adequate Wiring Bureau and requested Underwriters' Laboratories and the cable manufacturers to cooperate in producing a uniform identifying mark for the new de-

protenized rubber-covered wire without lead covering now approved for use underground in concrete or in damp places.

Emphasis on the necessity for education of the public to the purpose of the code and the work of inspection authorities found its way into convention deliberations in several places. Capt. Stephen E. Sanislo, Seattle Fire Dept. and chairman of the committee on publicity and education, keynoted this subject in the first morning session. J. W. Whittington of the LAEI public relations committee followed up with a showing of the sound slide film, "Getting the Most Out of Electricity Safely," now being made available for public meetings.

In discussion of article-committee reports as to how far adequacy requirements could be written into the code, whether the construction rules and specifications should be retained in the code and perhaps extended provoked the general answer "yes." Question as to the form these rules should take and whether they should be made a part of the code and "therefore mandatory" was referred back to the committees for recommendation next year.

Reports indicating a healthy condition in the two chapters in the section's territory were presented by W. L. Gaffney, chief inspector, Tacoma, on behalf of the Puget Sound Chapter, and by Blaine Grey, chief inspector, Salt Lake City, on behalf of the Utah Chapter. A. M. McLean of the vocational training department of Portland public schools offered amendments to the articles of association and by-laws which were approved.

Other speakers included: Arthur L. Abbott of the NEMA; K. W. Keene, associate electrical engineer, Underwriters' Laboratories, Inc., San Francisco; L. F. Adams, General Electric Co., Schenectady, and A. Penn Denton, Rigid Steel Conduit Assn., New York.

New and old officers of the Southwestern Section, IAEI—W. J. Tretheway, president; Otis Newcomb, second vice-president; Harold Gerber, secretary-treasurer; J. I. Dixon, first vice-president, and Edward McLaughlin, past president

several inspectors pointed out that here was a need of selling the adequacy idea to the public. Going stated this had been done successfully in Portland, code of which has always contained adequacy provisions far in advance of the NECode.

The address of H. N. Pye of Atlanta, president of the IAEI, lauded the work of the territorial sections in promoting needed changes in the code over the past ten years. He said that this function of the association was of "first and continuing importance." In his talk, Morrison discussed adequacy requirements, education of the public and the need of frequent periodical revisions of the code.

As propounded by H. S. Jenkins of Bellingham, Wash., chairman of the Chapter Ten committee, the question of

Elected president of the section for the next year was Chester M. Kirsop, chief inspector, Olympia, Wash. Grey was named vice-president; I. B. Sturgis, Portland, second vice-president, and F. D. Weber, Portland, secretary-treasurer.

Going was reelected representative to the executive council, IAEI. Weber was named representative to the electrical committee with Going as alternate.

New executive committee consists of W. H. Blood, Seattle; Verne B. Wilfley, Portland; S. B. Clark, Portland; G. R. Cooley, Seattle; Thomas E. Underwood, Spokane; Morrison and Gaffney.

Entertainment for the 110 visiting inspectors included the annual golf tournament, in which Clarence A. Moon, Spokane, won the Inspectors' Cup and A. M. McLean, Portland, the Harry B. Kirkland trophy; a trip to Grand Coulee; a theater party and buffet supper, and the annual banquet and dance.

Next year's meeting, it was decided, will be held in conjunction with the Southwestern Section in San Francisco during the Golden Gate International Exposition. Date will be sometime during August.

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Southwestern

Section, IAEI, debates feeder size for small residences. Long Beach is site of meeting

"If the inspector has refused to permit, for trial or otherwise, methods or materials which, according to his analysis, leave doubt as to their satisfactory performance, it is because the trust and dependency of the owner and the community upon him has left little place for the use of any by proved equipment," was the word that President Edward M. McLaughlin, city electrical inspector, Richmond, Calif., gave to the industry in his presidential address opening the 15th annual convention of the Southwestern Section, International Assn. of Electrical Inspectors, at Long Beach municipal auditorium, October 10, 11, 12, 1938. Well-attended, with a high percentage of "active" or inspector members, and accompanied by an exceptionally complete manufacturer's exhibit, the convention spent three busy days listening to industry papers and presentations. Indeed President McLaughlin deplored the lack of round table discussions of code interpretations, which were limited to two breakfast sessions. He advocated more time for such forums, grouping of code article committee members according to residence and chapter membership, appointment of clearing-house committeemen from each chapter to interchange the code revision recommendations more efficiently.

The two breakfast sessions, presided over by Carl Hardy, of Oakland on Tuesday, and Harry Dobson, of Santa Barbara, on Wednesday, discussed a problem which later came in for considerable debate when the clearing-house committee made its recommendations. It concerned feeder size computation for small residences and apartments. Recommended finally was that feeders supplying more than one branch circuit be not smaller than No. 10, and that where the feeder carries

Adequate wiring at the Long Beach industry luncheon to the inspectors—At the table are Frank Airey, E. M. McLaughlin, H. N. Pye, national president; Ralph Wiley (standing), Harold Gerber, R. H. Manahan and Victor Tousley, IAEI secretary

the entire load supplied by the service entrance conductors it shall not be smaller than the *required* minimum size of the service entrance conductors.

Wednesday morning's breakfast was made lively by a report from Vice-President W. J. Tretheway, city electrical inspector of Huntington Park, who told of finding corroded conduit, damaged by ship fire, dumped on the market and in use in new construction.

Two papers were of exceptional interest to the convention. The first, one on the effect of circuit arrangement on voltage drop and subsequently on the efficiency of customer's equipment, by Harold L. Gerber, chief inspector, San Francisco and secretary-treasurer of the Section, posed the question as to how far legislated codes could go to require capacities justified by economy and service to the customer yet not by safety alone.

Arthur Abbott, representing National Electrical Manufacturers Assn., provided a surprise when he introduced new tables developed after 8 years of research by manufacturers, which indicate that accepted wire carrying capacities, especially in the larger sizes, are too small to carry even their rated loads. Confined in a conduit, temperature rise is such as to destroy insulation. What effect this will have on future editions of the code was left to conjecture.

Other papers presenting vital subjects included:

"Power Factor Correction with Capacitors," by J. C. Porter, General Electric Co., Los Angeles.

"Explosion-proof fittings and equipment in relation to modern synthetic processes," by A. W. Rockwell, Appleton Electric Co., San Francisco.

Two talks on adequate wiring—one by Frank J. Airey, of Los Angeles, telling of the Electrical Development League's program; the other by E. G. Stahl, commercial manager, San Joaquin Light & Power Corp., Fresno, describing the activity to sell wiring in that region.

"Adventures in Electricity," by Dr. Phillips Thomas of Westinghouse Electric & Manufacturing Co. "Approved by Underwriters," a sound film by Underwriters Laboratories, Inc., introduced by H. C. Ufer, western superintendent. A short informal talk by A. R. Small, president of Underwriters, and chairman of the Electrical Committee, N. F. P. A.

"Conduit and conduit installations," by A. Penn Denton, engineer for Rigid Steel Conduit Manufacturers Assn.

"Protection of 125 volt circuits," by James S. Mahan, representing Fusestat manufacturers, told reasons for non-tamperable fuse.

Victor H. Tousley, secretary, I. A. E. I., reported on the history and accomplishments of the association during its existence.

L. F. Adams, General Electric Co., Schenectady, presented the safety advantages of the new synthetic insulating compound, Pyranol, in transformers and capacitors. J. W. Whittington, director of the Cord Manufacturers, told of the public relations program inspectors might conduct locally, and how they could use the new slide-sound film, "Getting the Most Out of Electricity Safely."

Controversial nine-point program for code revision submitted by the Edison Electric Institute did not reach the floor of the convention. The clearing-house committee announced it had no report, pending further data and study by committees.

President H. N. Pye, of I. A. E. I., in his address, recommended that the I. A. E. I. and the E. E. I. hold meetings to discuss further the proposed reductions in code requirements to pipe lengths, wire insulation, and extension of the covered neutral wiring system. Mr. Pye also advocated a committee to study the special rules now required in addition to the code in many localities, with a view to determining their necessity and incorporation into the code or elimination as the case might be.

New officers elected on the final day's meeting were: W. J. Tretheway, Huntington Park, president; J. I. Dixon, Santa Clara, first vice president; Otis W. Newcomb, Long Beach, second vice president; Harold L. Gerber, San Francisco, secretary-treasurer. Executive committee: Harry V. Dobson, Santa Barbara; and C. T. Coyle, Fresno, active members; H. L. Caldwell, Bureau of Power & Light, Los Angeles, cooperating company member; and C. E. Heise, Westinghouse Co., San Francisco, associate member.

Henry I. England of Gilson Electric Supply Co., chairman of the Pacific Division, National Electrical Wholesalers' Assn., presiding at the Santa Barbara meeting, with Secretary Albert Elliot at his side

Executive council I. A. E. I.; R. W. Wiley, San Francisco; George Kimball, San Francisco, and a new member, because of increased membership, G. E. Price, Orange County.

Entertainment included a visit to the Proctor & Gamble plant in Long Beach, a night on the fun zone, a dinner-dance at the Pacific Club at which H. G. Ufer was toastmaster, and W. A. Cyr, of ELECTRICAL WEST presented a fantastic "No-cost, No-wiring system" which he claimed to be as logical as the $30 every Thursday plan.

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Wholesalers

Pacific Division of the national association worries about the latest batch of laws

Existing and threatened legislation last month occupied the minds of wholesalers meeting at Montecito, Calif., for the fall session of the Pacific Division, National Electrical Wholesalers' Assn. Speakers at both open meetings discussed the topic.

The fire was set by Franklin B. Cole of the Los Angeles Chamber of Commerce, who talked on the new federal wage and hour law. He pointed out that inasmuch as California wage scales are well over the minimum the only concern of the wholesalers was with the details of arranging the work week so as to stay within the maximum 44 hr. per week per employee.

At the Saturday session, Harry Harper, Graybar Electric Co.; Byron Hanna, attorney and former president of Southern Californians, Inc., and Arthur H. Elliot, association secretary, followed up on Cole's opening. They were chiefly interested in the effect of the initiatives on the California ballot.

Story of the benefits to be derived by the electrical industry from participation in the Golden Gate International Exposition was presented by O. R. Doerr, Pacific Gas and Electric Co.; E. F. Champion of the exposition, and J. P. Price, General Electric Co.

Henry I. England, Gilson Electric Supply Co., Oakland, chairman of the division, presided.

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Reports

By delegates to the NECA'S national convention feature Los Angeles special meeting

Los Angeles Chapter, National Electrical Contractors' Assn. last month held a special meeting to hear the reports of its four delegates to the national convention in Detroit. A. L. Stone, president of the chapter and executive committeeman for Division 9, presided.

Stone reported on: Fair-trade practices. He suggested that the chapter work with northern California contractors to take advantage of the fair-trade laws. State inspection, such as in Michigan, where contractors have only a state license and inspection is done by the state. National headquarters going to bat with PWA over its action against bid depositories. Apprenticeship training and the necessity for training more journeymen. Pricing service and its value to contractors. Unit quotations on complete assemblies, and the protest now being made to wholesalers.

Clare Smallcomb, Smallcomb Electric Co., stressed the purpose he had in attending the convention. He went, he said, to find out what other plans of the association operation are now in use. His conclusion was that in spite of association work each contractor must continue to make a success of his own individual business.

Joe Newitt, secretary of the Los Angeles chapter, concurred largely in Smallcomb's findings. He said the success of an association operation depends upon the conviction of each member to operate his business at a profit. Newitt also reported that the final 100 pages of the last draft of the Los Angeles ordinance were being checked in his office.

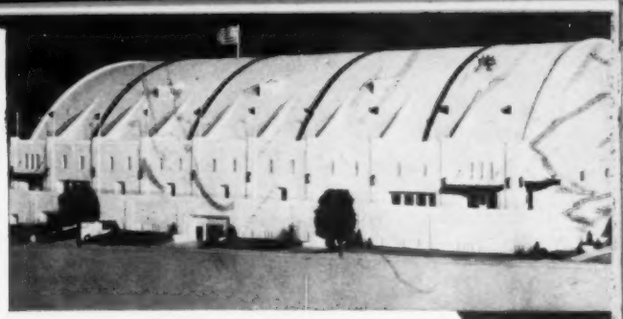
Herbert Evans, Nicolas Electric Co., quoted from Earl Peak, president of the NECA, who had advised that local chapters use the Robinson-Patman Act and engage in politics.

Other speakers at the session included Frank Vanderlip, Roy Gruendler and George deAth.

San Francisco Contractors Frolic at Annual Picnic

The San Francisco contractors' picnic is an all-industry affair, and always a happy one. Some of the committeemen who made it run like an electric clock are pictured here in action. At left are Gus Baraco, in charge of races and sports; behind Ralph Wiley (foreground), judge of events, is George Brouillet, who distributed prizes; at right is Ed Dowd, in charge of the whole picnic. Above are Ken Ryals, past president in whose honor the picnic was given; Brouillet; Walter Spencer, new president of the organization, and Ed Martin, horse-shoe pitching secretary

Youngstown Conduit



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The Hershey Sports Arena -- the largest span monolithic concrete structure in America -- is unusual in many respects but entirely regular in one. Its electrical circuits are encased in Youngstown Buckeye Hot Dipped Galvanized Conduit. The scheduled amusement of thousands of spectators is not left to chance when electrical systems are safeguarded by this well known rigid steel electrical conduit.

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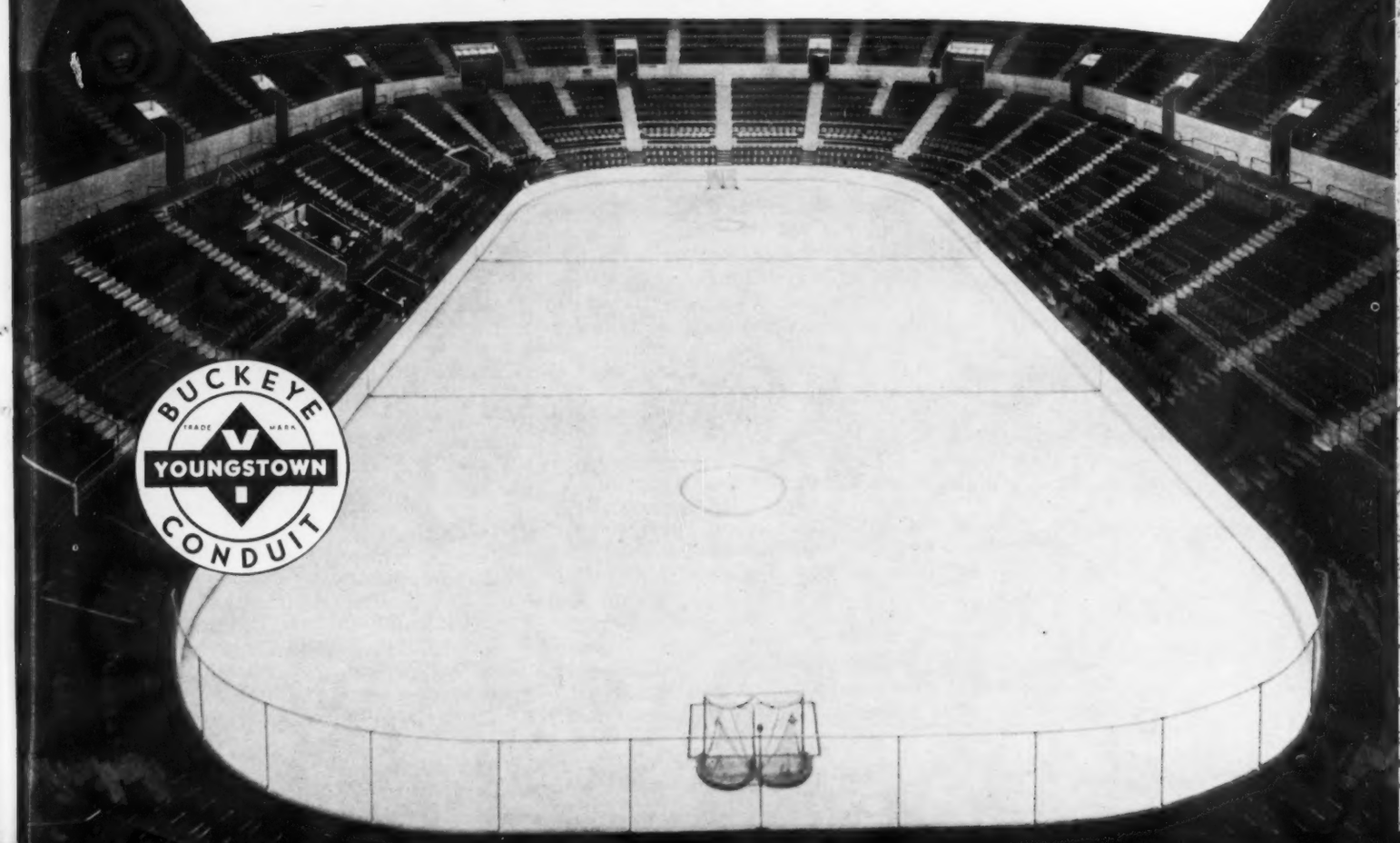


NEWS OF THE INDUSTRY

COUNTIES SET PURCHASE PRICE ON UTILITIES, SYSTEMS

Two southwest-Washington counties last month announced how much they were willing to pay in the purchase of private utility systems. According to J. D. Ross, Bonneville Administrator, who made the announcement, the Pacific County district would purchase Willapa Electric Co.'s system and transmission line between Raymond and Aberdeen at a total cost of $345,000. The Pacific County and Wahkiakum County districts would jointly buy West Coast Power Co.'s properties in the counties and a line extending into Cowlitz County for approximately $575,000.

Whether the utilities would accept the offers was not made known. In both instances arguments over the purchase price have waxed loud and long for months.

Other public ownership news consisted of the announcement of two elections:

Pierce County, Wash., residents finally made up their minds to vote on the establishment of a public utility district at the Nov. 8 election. Voters of the Truckee (Calif.) Public Utility District voted Nov. 4 on a $66,000 bond issue to erect a power plant for the district.

THIRTEEN POWER COMPANIES last month asked the Colorado State Board of Equalization for "substantial" reductions in 1938 assessed valuations, on which their tax levies will be made. They contended that while assessed valuations on all other property have been reduced 25.96 per cent in the last eight years, valuations on electric, gas and telephone firms have been increased 16.42 per cent.

P. G. & E. AUTHORIZED TO ABSORB SUBSIDIARIES

Pacific Gas and Electric Co. was last month authorized by the California Railroad Commission to absorb its two subsidiaries, San Joaquin Light & Power Corp. and Midland Counties Public Service Corp.

The merger eliminates P. G. & E. from the holding-company field.

Through the transfer, P. G. & E. acquires from the San Joaquin company 107,229 electric customers; from the Midland Counties company, 17,901 customers. Historical cost, depreciated, of the former's property was $67,350,759; of the latter's property, $5,364,695.

THIS IS A HOT ONE--- BAKED POTATOES

A British Columbia farmer decided he would have to protect his early-planted potatoes because of the cold weather. He laid a number of electric wires between the rows to keep the ground warm during the night.

But several hundred crows discovered the plan and decided the warm patch would be a good place to roost. The heat of the wires plus the heat of the crows' bodies baked the potatoes.

The crows found out what had happened, dug up the spuds and had them for breakfast before flying away.

The farmer says he's now stuck with a 1,000 ft. of wire and an electric bill.

But neighbors say he also has one swell story.

SAN FRANCISCO APPEALS HETCH HETCHY RULING

City of San Francisco last month appealed to the U. S. District Court of Appeals to reverse the federal-court decision ruling that the city's agency contract with Pacific Gas and Electric Co. is invalid. The lower court decision, which took the form of an injunction to stop the marketing of Hetch Hetchy power, is supposed to go into effect Dec. 28.

San Francisco based its appeal on the contention that the court erred in admitting as evidence Secretary of Interior Ickes' opinion that the contract violated the Raker Act. It was also claimed that the court was prejudicial in failing to admit evidence that a municipal distribution system would cost approximately $60,000,000 and would place the city dangerously close to its bonding limit.

UTAH PUBLIC SERVICE COMMISSION has approved the dissolution of the Bountiful (Utah) Light & Power Co. and the acquisition of its assets by Utah Power & Light Co., stockholder. In July the Bountiful company sold its distribution system to the city's municipal system and restricted business thereafter to outside territory adjacent to the city. Utah Power will cancel the outstanding stock in return for the properties.

OGDEN AGAIN REJECTS MUNICIPAL POWER PLANT

For the second time in two months Ogden, Utah, voters turned down the city commission's proposition to construct a municipal power plant. Vote, which was held late in September, showed 5,482 in favor of the plant, 6,533 opposed.

Cost of the proposed plant was $3,000,000: $1,350,000 to be financed by a PWA grant and $1,650,000 to be raised through the issuance of revenue bonds against the city.

At the first election, in which no federal grant was involved, voters rejected by a 1,200 majority a proposal to build a plant through issuance of $2,600,000 of revenue bonds.

Whether another effort will be made to build a plant is uncertain, city officials said.

NEEDLES COMPANY LOWERS RATES BY $15,000

Arrival in Needles, Calif., of Boulder Dam power last month occasioned a $15,000 rate reduction by Needles Gas & Electric Co.

Typical of the reduction was the change in residential service schedules. Formerly customers paid a minimum charge of $1.50; 14c per kw-hr. for the first 20 kw.-hr.; 8.5c for the next 20 kw.-hr.; 4.5c for all additional. New schedule carries a service charge of 60c. First 50 kw.-hr. will cost 7.5c per kw.-hr.; next 150, 3c; all additional, 1.5c.

Total reduction for the domestic combination service was 10.6 per cent; for the commercial lighting service, 10.9 per cent, and for general power service, 25 to 31 per cent.

The new transmission line is 100 mi. long, 66,000 volts.

CITIZENS' UTILITY CO. of Wallace, Ida., has received the Idaho Public Utilities Commission's approval to reduce residential and power rates in the towns of Wallace, Burke and Mullan by $6,000 annually. Approval was also given a 5-per-cent discount for prompt payment of bills.

CALIFORNIA RAILROAD COMMISSION has approved the merger of Southern Oregon Gas Co., California Utilities Co., Needles Gas & Electric Co. and Weaverville Electric Co. The new company will be known as the California-Oregon Utilities Co.

PACIFIC P. & L. REVEALS BONNEVILLE POLICY

Answering the question, "What about Bonneville power?" Pacific Power & Light Co. in a statement to its stockholders has announced that its policy is "to purchase such amounts of Bonneville energy as can be utilized advantageously in its system, and to pass on to its customers any savings that may result." Recognizing Bonneville as a reality, the company declares that it appreciates its responsibility to put the power to productive and beneficial use. It points out that the Bonneville rate schedules do not discriminate between utility companies and public agencies and that the company can purchase on terms as favorable as any other prospective user.

Existing hydroelectric plants of the company will continue to be operated at their most efficient capacity but they will be operated in conjunction with Bonneville in whatever manner may prove most economical. Pacific Power & Light Co. in its statement makes the following assurances:

(1) To continue to reduce rates as the use of electricity is further developed and its customers purchase the necessary utilization appliances. (2) To cooperate in community efforts to secure new power-using industries. (3) To promote a sound program of business development to increase use and thus reduce average rates. (4) To maintain high standards of service. (5) To continue to promote rural electrification. (6) To work for the agricultural, commercial and industrial development of its territory.

The statement points out that the company is not subsidized directly or indirectly by taxpayers but that it carries its full share of the growing cost of government; also that its rates, services and finances are under strict regulation and that its average rates are among the lowest in the country.

Northwest Electric Co. issued a similar statement on Bonneville.

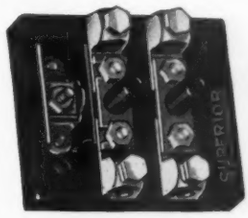
●

BECAUSE A GROUP of CCC enrollees in Oregon has completed a 2,200-volt line to Oregon Caves National Monuments, visitors to the caves need no longer carry carbide lights on their underground explorations. The new line, 4 mi. long, connects with California-Oregon Power Co.'s system.

●

IMPERIAL IRRIGATION DISTRICT, Brawley, Calif., last month turned power into part of its 600 miles of rural lines stretching throughout the territory. More than 1,800 persons will eventually be served by the lines.

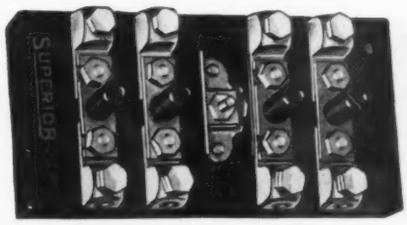
SELF-CONTAINED METER TEST BLOCKS



Cat. No. 7302-F Meter Test Block (2 pole, self-contained)

●

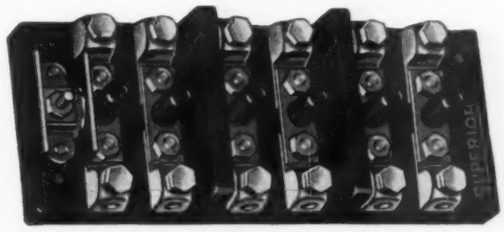
Superior Test Blocks for self-contained meters will safely carry heavy currents. They will make your self-contained meter tests safe, accurate, and rapid.



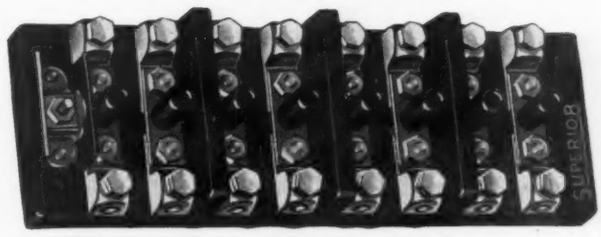
Cat. No. 7304-F Meter Test Block (4 pole, self-contained)

●

Put these blocks on your self-contained jobs.



Cat. No. 8626-F Meter Test Block (6 Pole, self-contained)



Cat. No. 8828-F Meter Test Block (8 pole, self-contained)

Self-Contained test block bulletin No. 364 is yours for the asking.

Superior Switchboard & Devices Company

CANTON, OHIO

*Been at it Since 1920

SUPERIOR

REG. U. S. PAT. OFF.

Reliable

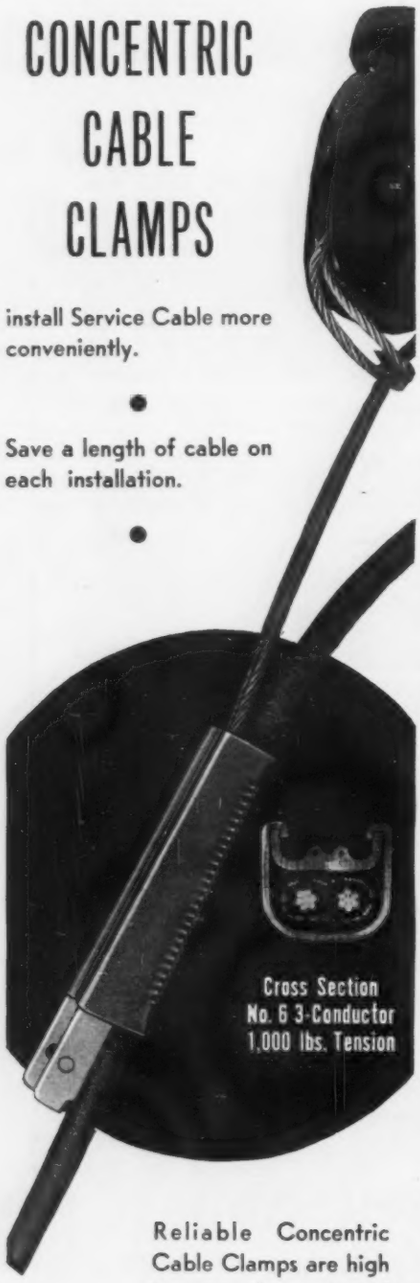
CONCENTRIC CABLE CLAMPS

install Service Cable more conveniently.

●

Save a length of cable on each installation.

●



Reliable Concentric Cable Clamps are high in strength, neat and non-corrosive. They do not injure the cable and they are reasonably priced.

Reliable ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES
3145 CARROLL AVENUE - CHICAGO ILLINOIS

TROY, MONT., CITIZENS late in September endorsed a proposition to build a municipal power plant and asked the city council to sign an application for a PWA grant. Under the proposal, the town would construct a hydroelectric plant on O'Brien Creek, from which it now gets its water. At present Troy is furnished power generated by Montana Power Co. and distributed to the town by Kootenai Light & Power Co.

●

GLENWOOD SPRINGS, COLO., voters last month went on record against purchase of a municipal power plant. The vote was 209 to 136. An ordinance under which the plant would have been financed was beaten, 197 to 130.

●

MUNICIPAL HYDROELECTRIC PLANT to be constructed at Fillmore, Utah, with PWA funds was assured when Fillmore taxpayers voted in favor of a $30,000 bond issue. The plant will cost $60,000. The city has for several years operated its own transformer and distributing system, but purchased power from the Telluride Power Co.

●

Supreme Court Upholds Decision on Provo Plant

Supreme Court last month refused to pass upon a Utah supreme court decision by which the City of Provo, Utah, is permitted to issue $850,000 in bonds to pay for a municipal power plant. The refusal in effect affirmed the validity of the state court's verdict.

Utah Power & Light Co., which holds a franchise to operate an electric distribution system in Provo, had appealed the Utah court's ruling upholding the ordinance enabling the city to proceed with construction contracts.

A week after the Supreme Court handed down its decision, Mayor Mark Anderson announced that another attempt would be made to purchase Utah Power's distribution system.

Four previous offers had been made by the city, but in all cases the time fixed for acceptance or rejection was less than the twenty days required by PWA, which is expected to make a grant of $491,116. However, the new offer was considered to be a mere formality. The same price, $200,000, as previously quoted was offered.

●

IN ORDER TO preserve and display some of the relics of the early pioneering of Utah Power & Light Co. and its predecessors, President George M. Gadsby has authorized establishment of the "Nunn Memorial Museum" in the Telluride Institute building at Olmsted, Utah. The museum is named for the late P. N. Nunn, Western electrical pioneer.

Kootenay Lake's Level to Be Raised by Utility

Application of West Kootenay Power & Light Co. to store water in Kootenay Lake, B. C., by raising its level 6 ft. was granted last month by an international joint commission.

Granting of the application included certain provisions designed to safeguard the interest of Idaho farmers who opposed the project on the grounds that it would damage their holdings by floods.

Lorne A. Campbell, vice-president and general manager of the power company, announced after the decision that the company's power plant at Upper Bonnington would be increased immediately from its present capacity of 32,000 hp. to 82,000 hp. Extra water in the lake will be drawn down in the winter to maintain power production.

The project provides for widening of the Kootenay River and Grohman Rapids, below the town of Nelson, in order to relieve the flood situation in Kootenay Lake and River.

●

IDAHO POWER CO. has completed construction of 8¼ mi. of line between Ontario and Weiser, thus linking the substations at the two points. New 55-ft. poles were used to carry the existing 66,000-volt transmission line and a new 110,000-volt distribution line. With the line and tap lines it will be possible to reach approximately 150 farms. Another trunk-line extension recently completed by the company is the 21-mi. Vale-Jamieson line.

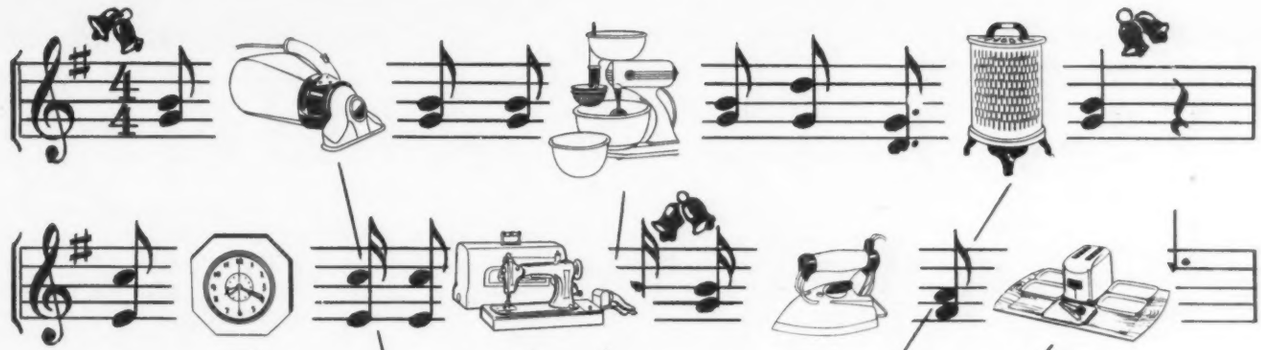
●

Portland G. E. Asks Purchase Of Mt. Hood Electric Co.

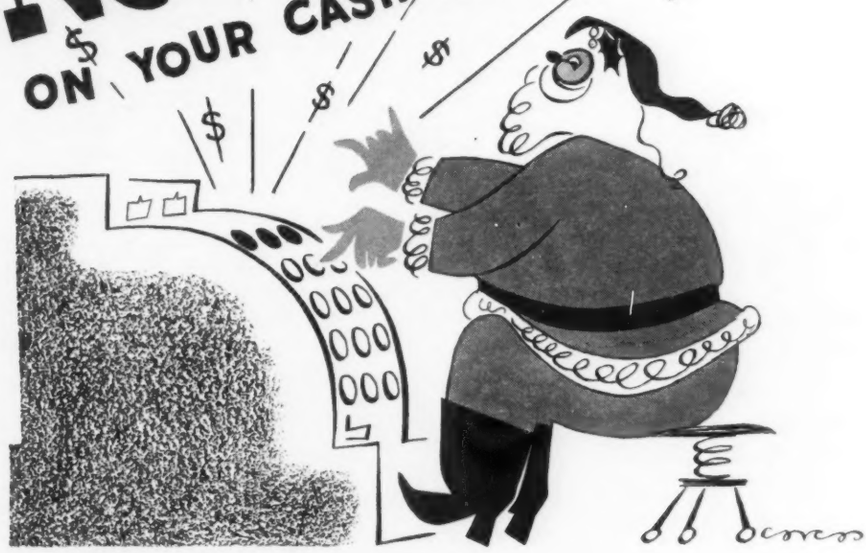
Portland General Electric Co. has filed with the Federal Power Commission an application for authorization to purchase the system and plant of the Mt. Hood Electric Co.

Contract submitted stipulates an approximate purchase price of $33,000. Portland G. E. would assume all existing customer contracts and serve all customers and territory now served by the Mt. Hood Company.

At present the Mt. Hood company, operating a transmission and distribution system in Clackamas County, Ore., purchases its energy wholesale from the Portland company. There is a physical connection between the lines of the two companies near the town of Sandy. The Mt. Hood company also owns and operates a wood-pole, 6,600-volt transmission line within Mt. Hood National Forest.



HOW TO PLAY JINGLE BELLS ON YOUR CASH REGISTER THIS YEAR!



WE don't blame you for wanting to ring up a nice profit for the holiday season . . . But it takes sales to make profits. Will you be one of those dealers whose cash register keeps ringing merrily?

We believe you can be—and we believe we can help you. By providing a complete line of attractive, up-to-the-minute electrical appliances. By providing well-designed, well-made appliances that are particularly appropriate for Christmas gifts. By providing tested, sure-selling appliances made by the foremost manufacturers in the field . . . and backed by Graybar's 69 year reputation for quality.

Go to town with Graybar this year! Write us—or ask your Graybar salesman.

OFFICES IN 83 PRINCIPAL CITIES EXECUTIVE OFFICES: GRAYBAR BUILDING, NEW YORK, N. Y.

Promote Industry With Bonneville Power, Says FPC

FPC has added weight to the claims of Walter W. R. May and Dr. Edwin T. Hodge in the September ELECTRICAL WEST that government-developed power should be used to promote industry in the Northwest.

Said the Commission in its release on "Power Requirements in Electrochemical, Electrometallurgical and Allied Industries": In the north Pacific coast, with its large and immediate possibilities of low-cost hydroelectric energy, there is a definite possibility of aluminum reduction from foreign ores delivered by cargo shipment on the Columbia River or on Puget Sound.

"The availability of iron ore, of iron and steel scrap and of coking coal suitable for electric furnace production, and the relatively small local capacity now installed, indicate that electric production of iron and steel alloys may be commercially feasible in the near future. Widespread deposits of manganese, chromium and other ores suggest the possibility of ferro-alloy production. Extensive resources of phosphate rock in Idaho, Wyoming, Utah and Montana are available for the manufacture of phosphoric acid and phosphates. More immediate prospects for the development of sodium chlorate and of calcium carbide are also to be noted.

"In the Southwestern states, ferroalloys and especially ferromanganese offer distinct possibilities. Zinc deposits in the region of Pioche, Nev., are favorable for either electrolytic or electrothermal production of zinc and zinc oxides. Magnesites in California and alunites in Utah may be used for the production of electrolytic magnesium and electric furnace potash. The ability to make potassium nitrate from potassium chloride and nitrogen peroxide, together with the potential need for additional ammonia for fertilizer use, indicate that new capacity for synthetic ammonia may be expected; perhaps utilizing power from Boulder Dam."

The commission estimated that past consumption of electric energy by electroprocess operations was 13,324,000,000 kw.-hr. annually. Future requirements probable within five years are estimated at 17,781,000,000 kw.-hr., an increase of approximately one-third.

●

SO MANY PEOPLE have commented on ELECTRICAL WEST's September cover that the editors feel they should know that the picture was taken on Nevada-California Electric Corp.'s system.

TRAILER TOURISTS in Yellowstone National Park will next year be able to put a coin in a slot machine and buy electricity. The National Park Service announced last month that it will install coin meters in the "Mammoth Campground." For 25c a trailer owner can buy all the current a trailer's gadgets can use in 24 hr. If the experiment is successful, the service may be extended to other national parks.

●

SEATTLE CITY COUNCIL's judiciary committee has taken under consideration a resolution asking the establishment of a city-owned telephone system. The measure would direct J. D. Ross, superintendent of City Light, to report on how much capital would be required for such a system, what rates would be necessary, etc. The council has already protested rate increases allegedly proposed by Pacific Tel. & Tel.

●

SIERRA PACIFIC POWER CO. last month asked the California Railroad Commission's approval to build lines to connect the Loyalton (Calif.) Municipal Lighting System, which it purchased last month, with its own lines.

●

PLANS HAVE BEEN approved for a 50-mi. extension to Fort Morgan, Colo., of the transmission line from Seminole Dam to Greeley. This will provide electricity for the town at Fort Morgan and for the surrounding rural region.

●

"TROUBLE SHOOTING" will be the subject discussed at the Nov. 15th meeting of the Electrical Maintenance Engineers' Assn. of Southern California.

●

WORK HAS BEEN started on a WPA project involving the clearing of 28,440 acres for the lake-bed of the 151-mi. reservoir to be created by Grand Coulee Dam. More than $9,000,000 will be expended on the job, the largest WPA project in the U. S.

●

SEATTLE CITY COUNCIL's authorization to clear an 8-mi. right-of-way for the Skagit transmission line from the town of Bothell to the King County border has been sought by Seattle City Light. Cost of the work would be $137,766, of which City Light would contribute $27,762 in tools, supervision and equipment.

●

PRODUCTION of electric energy for public use in the U. S. totaled 112,045,000,000 kw.-hr. in the year ending Aug. 31, according to the Federal Power Commission. Generation in August was the highest of any month this year.

Bonneville Contracts Awarded

EDITOR'S NOTE: By October 21 the Bonneville Administration had contracted to purchase $2,927,742 worth of transmission cable, towers, insulators, etc. Several million dollars worth of additional bids had been called and opened. Contracts awarded last month were:

To Aluminum Co. of America for conductors and appurtenances for North Bonneville-Condit, Wash., line, $109,102; for conductors and appurtenances for Condit-Grand Coulee line, $708,186; for conductor and appurtenances for Vancouver-Kelso, Wash., line, $128,600. Grand total, $945,888.

To American Bridge Co., Pittsburgh, for steel towers for Bonneville-Grand Coulee transmission line, $914,219; for towers for Bonneville-Vancouver line, $236,332; for towers for Vancouver-Kelso line, $140,424. Grand total, $1,290,975.

To Ohio Brass Co. for 13,968 insulators for Bonneville-The Dalles, Ore., line, $12,152; for 28,416 insulators for Kelso-Aberdeen, Wash., line, $24,721; for 68,500 insulators for Bonneville-Grand Coulee (northern division) line, $54,800; for 68,500 insulators for Bonneville-Grand Coulee (southern division) line, $54,800. To Westinghouse Electric & Mfg. Co. for 43,016 insulators for Bonneville-Eugene, Ore., line, $40,112. To General Electric Supply Corp., for 21,488 insulators for Vancouver-Kelso line, $20,692. Grand total, $207,279.

To Phelps-Dodge Copper Products Co. for transmission cable between Vancouver and Salem, $170,166.

●

Contracts Awarded

BY CENTRAL WASHINGTON COLLEGE of Education, Ellensburg, Wash., to J. J. Agutter, Seattle, for wiring of new training school, $17,951.

BY EVERETT, WASH., school board to NePage McKenny Co., Seattle, for electrical work on auditorium-gymnasium, $26,000; on new grade school, $1,915. To Brady Construction Co., Seattle, for electrical work on new gymnasium, $2,149.

BY EASTERN WASHINGTON COLLEGE of Education, Cheney, Wash., to Brown-Johnston Co., Spokane, for electrical work on new library, $8,056.

TO SCOTT BUTNER ELECTRIC CO., Oakland, for constructing and completing night-lighting installation at Sacramento Air Depot, $15,627.

TO NEPAGE MCKENNY CO., Seattle, for electrical work on addition to Cowlitz County courthouse, Kelso, Wash., $7,930.

BY SEATTLE BOARD OF PUBLIC WORKS to Roy W. Carlson, Cambridge, Mass., for furnishing electric resistance thermometers and apparatus to be installed at Ruby Dam, $5,682.

TO PELTON WATER WHEEL CO., San Francisco, for two 14,000-hp. turbines for station-service units at Grand Coulee power plant, $106,498; to Woodward Governor Co., Rockford, Ill., for two oil-pressure governors for station-service units, $19,236; to Westinghouse Electric & Mfg. Co. for two 12,500-kva. generators for station-service units, $193,480.

UNIVERSAL ELECTRIC OVEN

Broils - Bakes - Roasts

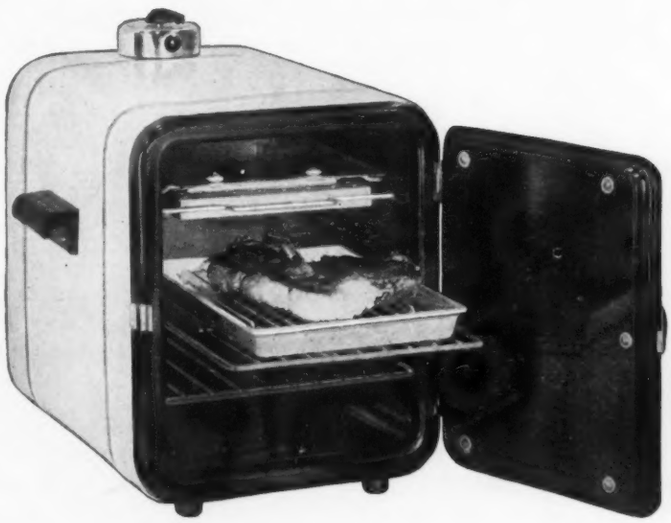
No Special Wiring Required

Cooks a complete oven dinner including a roast, 8 medium potatoes, peas and onions—sufficient for eight people.

No. E991

$29.95

With complete cooking equipment



Broils steaks, chops or fish with all the goodness seared in, the smokeless, spatterless way.

All the comforts, cleanliness and certainty of results of modern electric cooking.
Thousands of homes will want this New UNIVERSAL Electric Oven.
Its small cost and economical operation enable every housewife to have it.

MANUFACTURED BY **LANDERS, FRARY & CLARK** NEW BRITAIN, CONN.

A GRIP FOR ALL NEEDS

No. 1628-5 B. "Chicago" Grip. Maximum opening .563. Minimum opening .115. Safe Load, 8,000 lbs.

Here's the new "Chicago" Grip capable of handling messenger or guy strand from 3/16 in. diameter up to 1/2 in. diameter. A genuine all purpose grip that can also be used satisfactorily on bare conductors, solid or stranded, from No. 6 to No. 4/0 seven strand copper and A.C.-S.R. up to No. 3/0. A grip that even satisfactorily handles the new three-strand "copperweld" conductor. The bronze-lined jaws prevent slippage. This new grip will afford a sure hold under all conditions, with loads up to 8,000 lbs.

DISTRIBUTED THROUGH JOBBERS

Foreign Distributor: International Standard Electric Corp., New York

The four pamphlets listed below will be sent without charge to anyone interested. Check the ones you want:

- ☐ Safety for the Pole Climber.
- ☐ Specifications on Linemen's Belts and Safety Straps.
- ☐ The Safety Factor on Linemen's Leather Goods.
- ☐ Pocket Tool Guide.

Mathias KLEIN & Sons Established 1857 Chicago Ill USA

To McFarlane Electric Co., Santa Ana, Calif., for electrical work on new buildings at state hospital, Spadra, Calif., $3,197.

To H. D. Mainwaring & Co., Victoria, B.C., for supplying electric ranges and refrigerators and floodlighting for the new Sussex Hotel Apartment block at Victoria.

To Moore Electric Co. for electrical work on addition to building at site of Old Times Bldg., Los Angeles, $1,426.

To Bridgeman Electric Co., Albuquerque, N.M., for electrical work on new junior high school, Albuquerque, $915.

●

REA Activities

Roosevelt County (N.M.) Electric Membership Corp. has been allotted $177,000 to build 122 mi. of line in the county.

Fergus County (Mont.) Rural Electrification Cooperative Assn., has awarded a contract to Cahill-Mooney Construction Co., Butte, Mont., for constructing 83 mi. of line. $64,145.

Clearwater Valley Light & Power Assn., Lewiston, Ida., has awarded a contract to O. A. Carlson Electric Co., Seattle, for constructing 100 mi. of line. $73,819.

Intermountain Rural Electric Assn., Bailey, Colo., has been allotted $109,000 to build 99 mi. of line in Jefferson and Park Counties.

First REA-financed hydroelectric generating plant was put into service at Quinault, Wash., last month. Owned by Quinault Power Co., the plant will serve more than 150 families in Grays Harbor County.

Lower Yellowstone Rural Electrification Assn., Sidney, Mont., has awarded a contract to Manning & Noyes, Hysham, Mont., for building 22 mi. of line, $17,652.

Public Utility District No. 1 of Cowlitz County, Wash., opened bids Oct. 29 on construction of a substation.

Lower Valley Power & Light, Inc., Freedom, Wyo., has awarded a contract to Bennett & Taylor, Los Angeles, for constructing 67 mi. of line at a cost of $60,398 to finance house-wiring and plumbing installations.

ABOUT PEOPLE

Southern California IES Committees Appointed

Herbert J. Mayo, chairman of the Southern California Section, Illuminating Engineering Society, has appointed the following committees for 1938-39:

Program committee—H. B. May, Jr., chairman; F. T. Anderson, G. F. Aue and H. C. Barnard. Membership committee—L. M. Watson, chairman; G. F. Black, R. A. Crosby, W. T. German, H. M. Goodman, F. L. Hockensmith and C. E. Merryweather. Papers and data sheets committee — Alston Rodgers, chairman; A. W. Nye and G. M. Rankin. Nominating committee—L. A. Gates, chairman; German, and F. K. Sampson.

Lighting education committee—F. A. Hansen, chairman; J. A. Meyberg, Nye and Rankin. Publicity committee—F. W. Loomis, chairman; Hansen, W. E. Hershey and Hockensmith. Attendance committee—German, chairman; J. E. Daniels, Sam Mesick and Sampson. Residential lighting committee—Meyberg, chairman; Hansen, Joseph May, Maxwell Rosen and J. K. Strickley. Street and highway lighting committee—R. T. Dorsey, chairman; E. A. Culverwell, German, W. E. Lauer, W. H. McKinley, Al Pryor and W. A. Spraker. Society inter-relations committee—R. A. Crosby, chairman; H. T. Crane and E. P. Markee.

●

Gaylord Joins Lang Company; Succeeded by Daniel Brown

A. K. Gaylord, commercial cooking specialist for Portland General Electric Co., has taken a position as territorial salesman for F. S. Lang Mfg. Co., manufacturer of commercial electric ranges. He will make his headquarters in Portland and cover the Oregon territory.

Succeeding Gaylord in the promotion of cooking and baking loads for the light and power sales division of the utility is Daniel Brown, former district sales manager for Coleman Lamp & Stove Co., Wichita, Kan. Brown will work under Arthur H. Greisser, manager of the division.

●

Herman R. Larson has been appointed Central District service manager for Westinghouse Electric & Mfg. Co. Prior to joining the company in 1919 he was associated with the Tacoma (Wash.) Railway & Power Co. and the Puget Sound Electric Railway Co.

●

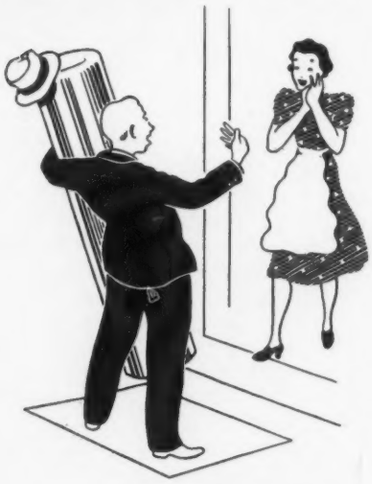
William B. MacLane, formerly connected with Thompson-Holmes Co., San Francisco appliance distributor, has been appointed director of public relations for the Western Merchandise Mart, San Francisco.

●

Walter R. Chitty, formerly local manager of Puget Sound Power & Light Co.'s Sultan office, has been promoted to local manager of the Snohomish office. He succeeded Charles H. Gillespie, who, because of ill health, has accepted less strenuous duties at Oak Harbor.

●

W. J. Taylor, merchandise manager of Canadian General Electric's Winnipeg office, has been named manager of the Winnipeg district, embracing all of Manitoba and Saskatchewan and part of northwestern Ontario.



Keep Water Heater Sales from

COOLING OFF

Solid Monel tank as installed in the well-known makes of automatic electric water heaters listed in panel. Every Monel tank carries a 20-year guarantee against failure from rust or corrosion.

. . . by Talking the

MONEL TANK

Solid Monel tanks in many well-known water heaters offer big value for buyers' dollars

Look at the makes of automatic electric water heaters that now feature Monel tanks: Such leaders as General Electric . . . Hotpoint . . . Thermidor . . . Wesix . . . Westinghouse. All now offer the user the finest kind of hot water service . . . from tanks that never fail.

Why are Monel tanks so popular? Consider the advantages they offer:

1. **Clean, rust free hot water . . . because Monel *cannot* rust.**
2. **Safe, dependable operation . . . because Monel is tougher and stronger than steel.**
3. **Years of trouble-free service . . . because Monel, tough, strong, rust proof and resistant to corrosion is long-lived. (Monel tanks carry a 20-year guarantee against failure from rust or corrosion.)**

How to Sell More Water Heaters

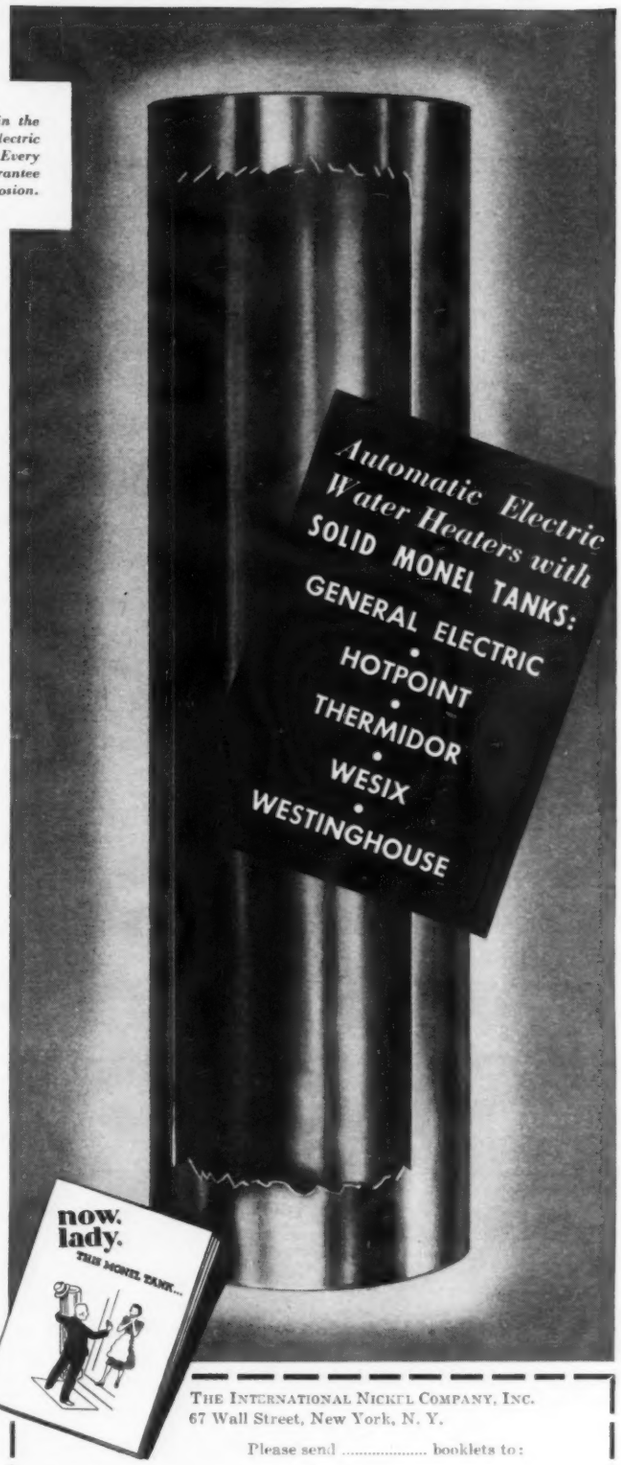
Shown at right is a booklet entitled "Now, lady, this Monel tank . . ." It is designed with one purpose in mind . . . *to help salesmen sell more water heaters.*

Chock full of real sales ammunition, this booklet should be in the hands of every water heater salesman. It tells how to approach the skeptical prospect, how to build up a real sales story around the Monel tank, how to answer objections . . . in short, how to deal with the toughest prospect and *get his name on the dotted line.*

See that each of your salesmen has a copy of this booklet. Send for your supply today. Mail the coupon to:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N. Y.**

"Monel" is a registered trade-mark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper.



THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

Please send ..... booklets to:

Name.....

Street.....

City..... *State*.....

EW 11-38

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

CLASSIFIED SECTION

• COST of undisplayed classified ads is 5 cents a word, minimum $1.00 insertion. Box numbers in care of our San Francisco office count as 10 words additional in undisplayed ads. • RATES per column inch of displayed ads is $3.75. • All classified ads are payable in advance.

HELP WANTED

Sales Engineer to take charge of District Office on Pacific Coast of large manufacturer selling nationally. Age between 33 and 40 years. Must be electrical engineering graduate. Give age, education, experience, references first letter. Replies treated confidential. Box W86, Electrical West, 833 Mission St., San Francisco.

DAVID FELBER, formerly asistant in charge of fixture sales, has been made manager of Incandescent Supply Co.'s Oakland office. Brandon McCarthy is associated with him as head of the Oakland business. Marvin Olsen has been added as a salesman to the company's Fresno staff.

•

CLAYTON S. COGGESHALL, a native of Emeryville, Calif., has been appointed manager of the turbine division, central station department, General Electric Co. He succeeds the late Robert B. Beale.

•

GEORGE BAKEWELL JR., formerly manager of the Denver Electrical League and a member of the Hotpoint organization, has been named a staff member of Albert Sechrist Mfg. Co., Denver. He is specializing in the lighting and fixture fields in the Denver territory.

DR. ROBERT H. CALKINS, Berkeley, Calif., and Dr. W. L. Durand and Dr. Willis H. Rich, both of Palo Alto, Calif., have been retained by Secretary of Interior Ickes in connection with the handling of the migratory fish problem in the Columbia River. A tentative plan has been worked out under which the fish will be trapped at Rock Island Dam and hauled by truck to ponds or new rivers.

•

MILTON CLARK has been named manager of dealer relations for Leo J. Meyberg Co., San Francisco appliance and radio distributor.

•

A. K. BENNETT, Los Angeles Bureau of Power & Light, has been given the responsibility of promoting the certified adequate wiring program among Bureau salesmen. In addition he will represent the Electrical Development League of Southern California in contact work with realtors, sub-dividers, architects and builders. Eleven bureau salesmen are working with him.

•

M. S. SMITH is now with Marshall-McCall, Vancouver, Wash., hardware and electrical dealer, as electric appliance salesman.

•

ALTON ULRICH has been appointed an electrical appliance salesman for Havre (Mont.) Furniture Co.

•

W. C. MAINWARING, B. C. Electric Railway Co.'s general sales manager, has been appointed chairman of the industrial-commercial division of Vancouver's Community Chest drive.

•

ROSS H. ADAMS, manager of Hendrie & Bolthoff Mfg. Co.'s electrical department, will head the Rocky Mountain Electrical League's "Give Something Electrical for Christmas" campaign.

•

MILT WALL, salesman for General Electric Supply Corp., Portland, won fourth place in a national electric fan contest held by the company. He made 273 per cent of his quota.

•

FRED G. GUTHRIE has been appointed representative for Electric Machinery Mfg. Co. in the San Francisco territory.

•

Speakers

At a series of adequate wiring meetings held in the territories of Southern California Edison Co. and Los Angeles Bureau of Power & Light by the Electrical Development League of Southern California and the Pacific Coast Electrical Bureau—Victor Hartley, managing director, electrical bureau; Walter Stickel, in charge of wiring promo-

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420 MARKET ST. SAN FRANCISCO, CAL.

MANUFACTURER'S REPRESENTATIVE FOR:

PYREX INSULATORS
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World's Largest Exclusive Mfgrs. of Capacitors
TRANSFORMERS
Gardner Electric Mfg. Co.
Power and Distribution Transformers
Lee Skipwith & Co., Inc.
Niagara Air-Insulated Current Transformers
CABLE GRIPS
Kellems Products, Inc.

CONNECTORS, GROUND ROD CLAMPS, UTILITY HOISTS
Jasper Blackburn Products Corp.
GROUND LINE POLE TREATMENT
Osmose Corp. of America
METERING INSTRUMENTS
Landis & Gyr., Inc.
CROMPTON TONG TEST AMMETER
Columbia Electric Mfg. Co.
UNDERGROUND TOOLS & EQUIPMENT
T. J. Cope, Incorporated
TREE TRIMMING EQUIPMENT
Bartlett Manufacturing Co.
FRICTION AND RUBBER TAPES
Clifton Manufacturing Co.

3 Adequate Stocks

Electrical Specialty Co., Inc., 316 Eleventh St., San Francisco.

Electrical Specialty Co. of Southern California, 449-451 South San Pedro St., Los Angeles.

Electrical Specialty Company, 714 Fourth Ave., Seattle.

• Two more stocks just added. This makes three stocks of NICHROME* and other D-H electrical alloys serving Pacific Coast users. No waiting for shipments. No long-distance correspondence.

*Reg. U. S. Pat. Off.

DRIVER-HARRIS COMPANY
Harrison, N. J.

NICHROME

tion for the league; Graham Holabird, National Electric Products Corp.; Howard Douglas, in charge of the Edison company's Red Seal sales work; Arthur Rowley, Thermador Electric Mfg. Co.; Henry C. Rice, merchandise manager, Edison company, and F. L. Hockensmith, league manager.

F. B. Nightingale, Los Angeles illuminating engineer and designer of garden lighting equipment—before the San Francisco Business Mens' Garden Club.

At a series of meetings held by the Los Angeles Bureau of Power & Light for the purpose of promoting the sale of electric water heaters by Los Angeles plumbers—Herbert Langlois and Jerry D. Allen of the bureau.

At a series of adequate-wiring meetings held by San Joaquin Light & Power Corp. for dealers, wiremen and manufacturers' representatives — Kenneth E. Hampton manager of heavy-duty wiring, Valley Electrical Supply Co.; J. E. Hammond, lighting specialist; G. E. Zelhart, commercial sales department, and E. G. Stahl, general sales manager, all of the San Joaquin company.

●

Deaths

CARL F. UHDEN, 65 retired hydraulic engineer who supervised construction of Seattle City Light's first hydroelectric plant on the Skagit River, died Oct. 11. Before he went to Seattle from Spokane twenty years ago, Mr. Uhden was in the employ of the Washington Water Power Co. Besides supervising work at Seattle's Gorge Creek Plant on the Skagit, he was in charge of several other hydroelectric developments in the State of Washington.

●

GEORGE A. ELDRIDGE, 78, retired traffic superintendent of Utah Light & Traction Co., died in Salt Lake City Aug. 25. Mr. Eldridge joined the company in 1889 and retired in 1926.

TRADE NOTES

CALIFORNIA ELECTRIC SUPPLY CO., San Francisco home appliance distributor, has opened an office and showroom in the Western Merchandise Mart. Included in the several lines displayed are Standard electric ranges. Frank L. Robinson, Western divisional manager of Standard Electric Mfg. Co., will also maintain headquarters in the Mart.

●

HARVEY'S HOME APPLIANCE, Long Beach, Calif., has opened a branch store at 210 E. Artesia, Bellflower, Calif.

MODERN UTILITIES CO., Helena, Mont., has been organized to retail electrical merchandise in that area. Leon Hampton is president and general manager.

●

COLE REFRIGERATION is the new name of Modern Utilities Co., Great Falls, Mont.

●

NELSON APPLIANCE is a new store opened in Spanish Fork, Utah, by I. C. Nelson. The store handles Westinghouse appliances.

●

BART-KINNISON CO., San Francisco, has been appointed Western representative for Lagin-Victor Corp., manufacturer of table lamps, juvenile lamps and "musical kiddie" lamps.

●

WEATHERBY & WHITE is a new Livingston, Mont., furniture and appliance store.

●

WESTERN MONTANA ELECTRIC CO., Missoula, has taken on the Hotpoint line of appliances.

●

Moved

HOME APPLIANCE CO., Vancouver, Wash., into new salesrooms on Main St. near 18th.

MACK'S RADIO & MUSIC SERVICE, Vancouver, Wash., into new store at 1208 Main St.

HOME APPLIANCE CO., Portland, into new building at 935 N.W. Lovejoy.

DOHSE, INC., dealer in radio, washers, ranges, vacuums and refrigerators, from 5966 Pacific Blvd., Huntington Park, Calif., to 2721 W. Slauson Blvd., Los Angeles.

FORSTER RADIO & FURNITURE CO., San Pedro, Calif., from 362 W. Sixth to 387-89 W. Sixth. Double space is available for appliance display.

LOS ANGELES BUREAU OF POWER & LIGHT'S business agents' division to the Homer Laughlin Bldg., 315 S. Broadway. The bureau now occupies the entire second, third and fourth floors and one-half of the fifth floor of the building.

JOHN OUST, Visalia, Calif., contractor, to 420 E. Main St. Oust has just been awarded the contract for a new street-lighting installation in the town.

CHESTER MCCALL ELECTRIC SHOP from 814 E. 16th St. to 748 E. 8th St., Los Angeles.

PERRY ELECTRIC CO. from 2029 Eighth Ave. to 3803 W. 21st St., Los Angeles.

MERITT ELECTRIC CO. from 58 Bepler St. to 244 Hillside Blvd., Daly City, Calif.

JIM BAKER, "Electrifier," from 1005 Baker St. to 914 Nineteenth Ave., Bakersfield, Calif., where a new pair of buildings houses his store and display room and shop. Inside the showroom Baker has installed shelving for glassware; fixtures are hung from plywood panels on the ceiling. These fixtures are arranged in three rows on alternate circuits so that by means of pull-chain switches any fixture on display can be lighted.

● 36 years ceramic leadership provides us with enviable technique in handling your problems. Why not contact our representatives shown below? Samples and literature available upon request.

The Electric Material Company, Inc.
Room 225, 163 Second Street
San Francisco, Calif.

The Electric Material Company, Inc.
Room 328, 912 East Third Street,
Los Angeles, Calif.

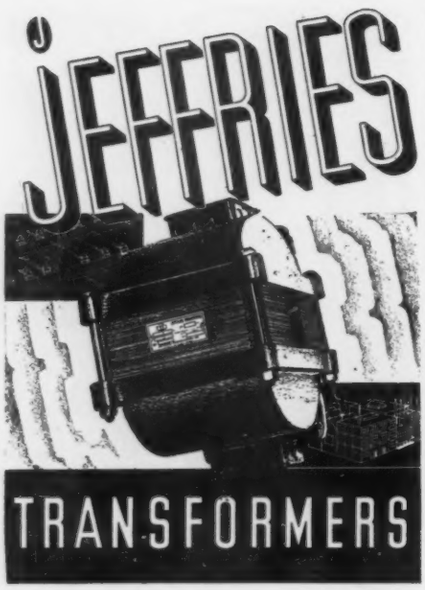
AMERICAN LAVA CORPORATION
CHATTANOOGA, TENN.

Is an
AGENCY ACCOUNT
expensive?

By saving valuable time and avoiding losses due to mistakes and delays, our Agency Service for handling securities often is an actual economy rather than an expense. But in any event the cost is moderate. Send for our descriptive booklet, *An Introduction to Agency Service.*

Just ask for Booklet M-3

CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO
California's Oldest National Bank



Save Their Cost and Pay Dividends by—

1. Elimination of duplicate conduit runs.
2. Saving in power rate.

(Put all of your 110-volt equipment on a 220-volt or 440-volt power circuit, it is economical.)

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave. Los Angeles

Crapo
GALVANIZED PRODUCTS

Where strains and stresses are heaviest, where corrosion takes its greatest toll, *Crapo* Galvanized Steel Strand and Telephone Wire constantly are proving their outstanding superiority. The heavy, tenaciously bonded zinc coating, maximum tensile strength and correct ductility insure longer life and lower maintenance cost. Insist upon *Crapo* Galvanized Products for better performance under all conditions! Ask your Jobber or write direct!

INDIANA STEEL & WIRE CO.
MUNCIE, ♦ INDIANA

Crapo Galvanized Strand and Telephone Wire can be obtained readily in all standard grades and sizes.

A Hardware Store Grows Up

Forst's, Ltd., Vancouver, B. C., is typical of a store that gets the bull by the tail. In this case, the bull is sales, and the store has grown and grown. In 1930 Forst's was a hardware firm doing business in an outlying shopping district. That year it took on a line of electrical appliances. Expansion started. In no time at all the company had spread laterally (see cut) into four adjacent stores, each of which now features a special appliance. When the firm discovered it was handling sales coming from other neighborhoods it decided to put up branch stores. Now numbering five, these branches account for the many recent Trade Notes about Forst's. Ninety per cent of the company's business is electrical. It employs no field selling, but relies on its branches and heavy newspaper advertising (it is second only to B. C. Electric Co. in space used for advertising) to contact customers. It also participates in fairs on a large scale. Salesmen, trained to bargain for short terms, tell the customer that he is saving money by paying for appliances as quickly as possible. Results: The credit-gambling problem is solved; the next appliance sells quicker

PRODUCT DATA

Is there a knotty problem puzzling you? Do you need more information on switchgear or refrigerators, relays or luminaires? If so, these manufacturers' bulletins, selected extra carefully for their value to you, offer the simple, most readily available answers . . . Simply address a postcard to ELECTRICAL WEST and ask for the desired bulletin by number. It will cost you nothing. It will be mailed to you as quickly as human ingenuity can work.

1101:
NEW LINE of transformers designed for use with fluorescent luminous tubing is described in a new bulletin by Jefferson Electric Co. The transformers may be surface or flush mounted. A number of suggested designs and installations, as well as specifications and dimension data are included.

1102:
DIRECT-CURRENT LIGHTNING ARRESTERS especially applicable for railway and industrial service are described in an illustrated leaflet by Westnghouse. One type, known as MP, is available in two voltage classes, 100 to 400 volts and 400 to 750 volts. The IC arrestor is available in three classes, 0 to 750 volts, 751 to 2,000 volts and 2,001 to 3,900 volts for application to normal 600- 1,800- and 3,000-volt classes of equipment.

1103:
NEW 32-PAGE CATALOG on current and potential transformers has been issued by R. E. Uptegraff Mfg. Co. The hook is illustrated with the various types and contains detailed information and prices.

1104:
"HOW TO MAKE A PERFECT SPLICE" is the title of a 4-page leaflet published by the Okonite Co. Covered are the correct procedures in making a joint in rubber-insulated cables for operation up to 5,000 volts; in multiple-conductor cables; braided cables; lead-covered cables; armored cables, and in cables for operation over 5,000 volts. The booklet advises use of various Okonite products.

1105:
YEARS OF TROUBLE-FREE service are assured by the construction features of its moderate-capacity, outdoor, oil-blast circuit breakers, General Electric says in a 4-page bulletin, GEA-1025B. Economical operation, so it is said, is assured because interrupting ratings are conservative; arcs are of short duration; the oil-blast contact is simple and strong; faults are cleared immediately.

1106:
R. H. GREEN, INC., specialty manufacturer, has released a new dealers' price list covering reducing washers, reducing locknuts, conduit closers, hanger iron, anchor bolts, telephone bracket clips, knockout seals, ground clamps, ground strips and one-hole pipe straps. The company is now marketing for the first time a package containing 100 knockout seals of assorted sizes.

1107:
"VACU-BREAK" COMPACT-TYPE switchboards are described in a bulletin by Bull Dog Electric Products Co. The company claims that the switchboards represent a more compact, modernized type of feeder distribution center. They feature quick make and quick break switching with positive arc control.

1108:
MORE THAN AN ORDINARY catalog is James R. Kearney Corp.'s new 80-page bullettin on "Hi-Line" tools and accessories. In addition to giving lists and tables of sizes and prices, the catalog carries many illustrations and diagrams and rather lengthy text describing the various items.

1109:
DETAILED ENGINEERING INFORMATION is given on the subject of telemetering instrument readers in Bristol Co.'s 24-page publication covering the metameter system of telemetering. Various models available for remote measurement and automatic control of pressure, vacuum, liquid level, temperature, flow voltage, current, load and totalizing power load are illustrated. The company says the booklet will be of value in the reference files of every operating and supervising engineer.

1110:
DRY BORIC-ACID power fuses used for the protection of high-voltage circuits and equipment, applicable in utility and industrial power plants and for all high-voltage power use, indoor and outdoor, are described in an illustrated booklet by Westinghouse. The booklet tells how the fuses save money, interrupt low-current and high-current faults and eliminate noise and flame.

1111:
ILLUSTRATED 12-PAGE catalog issued by Carrier Corp. shows the extent of equipment available to serve industry for air conditioning, refrigeration and space heating. The publication is indexed so that ready reference may be made for temperature and humidity control, refrigeration, heating or dehydration.

1112:
STANDARDIZED LIGHTING EQUIPMENT for fluorescent lamps is covered in a new catalog by DayBrite Lighting, Inc. Included in the descriptions are lighting fixtures for fluorescent lumiline lamps, surface fixtures, reflector channels, continuous showcase fixtures, continuous cove-lighting fixtures, unwired units, continuous wallcase troughs, etc.

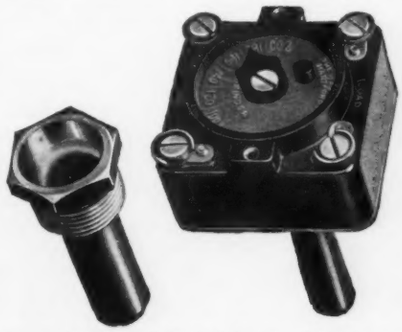
1113:
DESIGNED TO MEET the demand for simple, sensitive and accurate devices for control, regulating or protective service are General Electric's a.c. and d.c. relays, type GTR. The relays, which operate on either the "float-action" or "snap-action" principle, are described in bulletin GEA-2961.

1114:
LINE OF PANEL INSTRUMENTS covering industrial and radio applications in a variety of forms is described in a 12-page catalog by Westinghouse. The instruments provide for the measurement of direct current, rectox types, thermocouple types and alternating current.

NEW PRODUCTS

Thermostat

The "Diamond H" hydraulic thermostat has been designed by Hart Mfg. Co. to regulate the temperature of liquids between 100 and 200 deg. F. It is especially adapted for use in electric water heaters. The thermostat is small and compact. An adapter tube 3 in. long is furnished with standard ¾-inch pipe thread for insertion in the tank, the thermostat snapping in place by means of two heavy clips. Temperature setting is made on the face of the instrument. Positive snap action is said to be obtained by a specially designed beryllium plate operated directly by



the expansion of liquid in the bellows and tube inserted in the adapter. Heavy silver contacts make and break the circuits with clean action. The thermostat is rated at 20 amp., 250 volts; 35 amp., 125 volts, a.c. only.

●

Disconnect Switch

Recently completed by I-T-E Circuit Breaker Co. was a hand operated, three-hole, 10,000-amp. disconnect switch. This switch is so constructed that all three poles are opened or closed in unison, thus constituting, in effect, the opening or closing of a 30,000-amp., single pole switch. The company asks that the user "contrast the ease with which this huge switch is manually operated with the effort required to operate a conventional-type knife-switch of one-fourth the amperage."

●

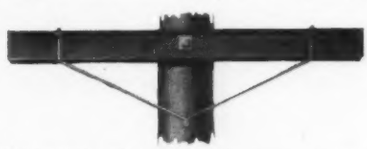
Lug

"Varilug" is the name of a new lug manufactured by Burndy Engineering Co., Inc., and recommended for connecting a wide range of cable sizes without keeping an extensive stock of lugs on hand. The Varilug's flattened U-bolt not only makes it possible to use this connector on many sizes of cable, but also prevents damage to highly compressible flexible and extra-flexible cable.

●

Crossarm Brace

Hubbard & Co says that its new crossarm brace is the first real change in braces in many years. It is compact and light, being formed of one continuous piece of ⅜-in., high-

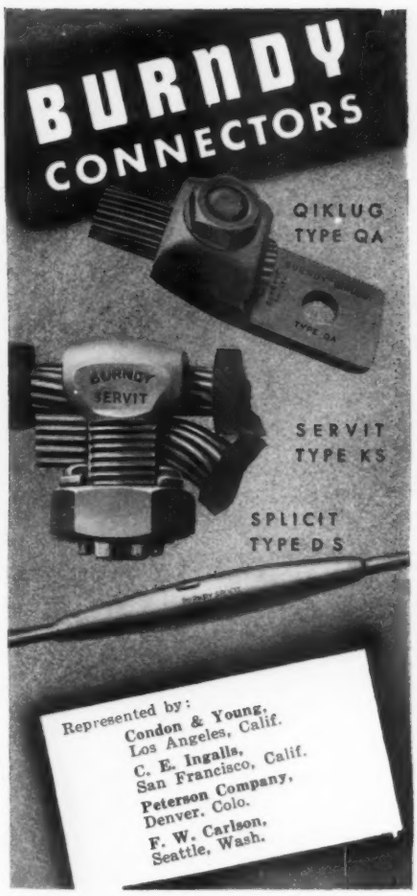


carbon steel rod. It is strong and easy to handle or install. In the case of two of the styles, only two pieces are involved in the construction. Owing to the few parts, Hubbard claims that cost is low and elimination of radio interference complete. The brace is furnished in a variety of styles covering several methods of attachment.

●

Fruit & Vegetable Mixer

Now brought up to date for use in the home as well as in public restaurants is the Waring Mixer, manufactured by the corporation of the same name. The mixer, by means of a high-speed motor and a peculiarly shaped container, reduces fruit, vegetables and even meats and seafoods to invisible particles. Thus it makes drinks of food.



THEY SELL THEMSELVES
in any demonstration

CHROMALOX
Super-Speed
RANGE UNITS

The economical "two-units-in-one" feature will instantly "steal the show." The easily-cleaned flat top will get the applause of every housewife . . . Sell Chromalox-equipped ranges . . . Save by standardizing on Chromalox units for all replacements. They fit any range.

Our nearest representative will be glad to work with you.

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MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. Third St., Los Angeles, Calif.

THE PETERSON COMPANY
1921 Blake St., Denver, Colo.

EDWIN L. WIEGAND CO.
7540 Thomas Blvd. Pittsburgh, Pa.

Iron

Newly designed Ironmaster manufactured by Chicago Flexible Shaft Co. is said to be the fastest iron ever made. Because of the double-thermostatic heat control, the iron reaches low heat for artificial silks in 30 sec., full ironing heat in 2½ min. New features are a cool, bakelite handle and a permanently attached cord-set built into the handle on the side.

●

Oil Disconnect

New form of oil disconnect manufactured by G & W Electric Specialty Co. has three sets of gang-operated disconnecting links enclosed in a compact tank which serves as a switching unit for by-passing voltage regulators. The two outer switching links connect the regulator leads to the line; the middle switching links close the line for by-passing the regulators. The outer and middle links are properly interlocked mechanically and electrically.

●

Floodlights

Six new open-type, 750 - 1,000 - 1,500 - watt floodlights are said to be of the very latest

scientific design. Manufactured by S & M Lamp Co., they are finished in "Alzak" and available in both specular and diffused surfaces with beam spreads ranging from 15 to 100 deg. Bracket assembly and wiring provisions provide easy, simplified installation.

●

Self-Contained Lighting Unit

Designed for indoor and outdoor projection and floodlighting applications is a new General Electric lamp combining within a single sealed unit all the elements necessary for the production of controlled light. The Projector lamp, as the unit is called, embodies a pressed-glass reflector and a light-redirecting cover lens as part of a funnel-shaped glass bulb. Available are two types of lenses, one giving a wide beam, the other a narrow beam. Using a 150-watt filament, the light employs a medium screw base that fits the conventional socket. Both reflector and pre-focused filament are permanently fixed in place during the process of manufacture.

Fuseless Main Switches

New line of fuseless main switches providing up to six branch circuits has been announced by Colt's Patent Fire Arms Mfg. Co. The units are furnished in both long and short cabinets, the long cabinets providing space for both transformer and Despard-type switches. Entire interior mechanism is easily removed to facilitate wiring. Flush-type cabinets are furnished with plastic adjustment, 30 amp., 120-250 volts with solid neutral, front-operated rotor-disc switches.

●

Range Units

Edwin L. Wiegand Co. has announced a new series of Chromalox super-speed range units with simmering heat feature. These units have an unbalanced rating and are for use on ranges equipped with three-heat, series-parallel type switches or load-balancing switches which have a connected neutral. They are for use primarily by range owners who desire the convenience and economy of one or more simmer heat units.

●

"Locklite"

New principle of attaching industrial reflectors, which speeds installation, reduces maintenance and provides increased safety with interchangeability of reflector units, has been announced by Westinghouse. With this disconnecting device, called "Locklite," the company says it is impossible to light the lamp until the reflector is properly locked into place. The lighting of the lamp automatically insures that the reflector is securely attached for service. Each unit consists of a hood and a receptacle into which the reflector with the lamp-holder fits. When the lugs on the neck of the reflector lock into the slots of the hood, the electrical connection is made.

●

Heavy Duty Relay

Relay for heavy duty service on a.c. or d.c. circuits has been developed by Ward Leonard Electric Co. Large gap, silver-to-silver, self-aligning contacts with adequate surfaces and pressures to break 30 amp. and insulating material to withstand 2,500-volt dielectric test are said to make these relays suitable for light contactor duty. The Y-type contact arm, using a large coil spring for pressure as in contactor construction, provides simplicity and sturdiness in design. The relays are listed for 6, 12, 24, 32, 115 and 230 volts a.c. and d.c.

●

Bed Lamp

Especially popular with those people who like to read in bed is Colonial Premier Co.'s Wallette lamp. To meet the demand for a lower-priced wall lamp, the company has now brought out the Wallette Jr., priced to retail at from $7.95 to $9.95. The lamp has a 6-in. plastic diffusing bowl and is wired for a 75- or 100-watt bulb. Exclusive feature is the movable shade, which can be raised or lowered by pulling or lifting the counterweighted silk rope.

Switch Stick

Switch stick with patented hook, now being marketed by Schweitzer & Conrad, Inc., is said to provide safe, positive control. In place of the usual short steel hook extending at right angles to the stick, the new stick employs a 6-in. length of tempered steel rod bent into a spiral shape for pulling, grasping and carrying. With this stick disconnect switches, cutout tubes and fuses may be opened, removed and replaced without danger of the hook's slipping off. The stick is especially adaptable to many kinds of overhead line work.

●

By-Pass Disconnect

A 400-amp. by-pass disconnect switch for 7,500-750 volts has been announced by James R. Kearney Corp. When pulled out of the multi-point pressure contacts, the double blades are by-passed and short circuited. The auxiliary switch functions automatically to break the regulators exciting current, after which the by-passed equipment, having been completely isolated, can be worked on safely. The company claims that three by-pass disconnects perform more efficiently than nine conventional solid-blade disconnects used with three regulators installed on a four-wire circuit.

●

Explosion-Proof Lighting Units

To provide an explosion-proof lighting unit for locations in which it is not possible to mount the fixtures overhead, Benjamin Electric Co. has announced a series of angle-bracket type explosion-proof fixtures suitable for side-wall mounting. The units are listed by Underwriters' Laboratories as suitable for hazardous locations in which such flammable volatile liquids as ethyl ether, gasoline, petroleum, naphtha and alcohol are manufactured or stored.

●

Repeating Fused Gaps

Line of repeating fused gaps for use at important switching centers to reduce circuit-breaker operations, thereby effecting savings in inspection and maintenance costs, has been announced by James R. Kearney Corp. The three fuse cartridges are in series with the air gap. Surges which break across the gap travel over the fuse link and are grounded almost instantaneously. The follow-up current which blows the fuse link is extinguished in the fibre tube before the circuit breakers trip. Tension released when the fuse blows causes the cartridge to trip-out of the circuit, indicating an operation. The reclosing action is provided by a spring and lever mechanism. The repeating fused gaps are supplied for pole or crossarm mounting in ratings 5 through 23 kv. and channel-base mounted in sizes 7.5 through 69 kv.

WHERE TO BUY IN THE WEST

Air Conditioning
Frigidaire Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Kelvinator Corp.
Norge Division, Borg-Warner Corp.

Ammeters and Voltmeters
Ferranti Elec., Inc.
General Elec. Co.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec. Instr. Corp.

Anchor and Guy Rods
A. B. Chance Co.
General Elec. Co.
Hubard & Co.
Maydwell & Hartzell, Inc.

Anchors, Guy
A. B. Chance Co.
Everstick Anchor Co.
Hubbard & Co.
James R. Kearney Corp.
W. N. Matthews Corp.

Appliances, Household
Apex-Rotarex Mfg. Co.
Chicago Flexible Shaft Co.
Clements Mfg. Co.
Easy Washing Machine Corp.
Edison General Elec. Appliance Co., Inc.
Frigidaire Division
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Kelvinator Division
Landers, Frary & Clark
Leonard Division
Malleable Iron Range Co.
National Enameling & Stamping Co.
Noblitt-Sparks Industries, Inc.
Standard Elec. Mfg. Corp.
The Silex Co.
Utility Electric Co.
Wesix Elec. Heater Co.
Westinghouse Elec. & Mfg. Co.

Boxes
General Cable Corp.
General Elec. Co.
Superior Switchboard & Devices Co.
Westinghouse Elec. & Mfg. Co.

Brackets, Wood
Locust Pin Co.

Breakers
Air Circuit Breakers
Electric Material Co.
General Elec. Co.
I-T-E Circuit Breaker Co.
Roller-Smith Co.
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Oil Circuit Breakers
Allis-Chalmers Mfg. Co.
Electric Material Co.
General Elec. Co.
Pacific Elec. Mfg. Corp.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.

Bus Fittings
Burndy Eng'g Co.
General Elec. Co.

Buses
Aluminum Co. of America

Bushings
General Elec. Co.
Graybar Electric Co.
Lapp Insulator Co., Inc.
Locke Insulator Corp.
Ohio Brass Company
Westinghouse Elec. & Mfg. Co.

Cable Accessories
General Cable Corp.
General Elec. Co.
James R. Kearney Corp.
John A. Roebling's Sons Co.

Cable, Armored
American Steel & Wire Co.
General Electric Co.
Hazard Ins. Wire Works
Okonite Company
Roebling's Sons Co., John A.
Triangle Conduit & Cable Co.
Wiremold Company

Cables
Aluminum Co. of America
American Steel & Wire Co.
Columbia Steel Co.
Copperweld Steel Co.
Crescent Ins. Wire & Cable Co.
Crucible Steel Co. of America
General Cable Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Hazard Ins. Wire Works
Indiana Steel & Wire Co.
Marwood Limited
Maydwell & Hartzell, Inc.
The Okonite Co.
Okonite-Callender Cable Co.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
Triangle Conduit & Cable Co., Inc.
United States Steel Corp.
Westinghouse Elec. & Mfg. Co.

Carbon Brushes
National Carbon Co., Inc.
Union Carbide & Carbon Corp.

Carbon Products
National Carbon Co., Inc.
Union Carbide & Carbon Corp.

Chimes
Square D Co.

Clamps, Ground
Copperweld Steel Co.
B. Hartman
Reliable Elec. Co.

Coffee Makers
Glass Coffee Brewer Corp.
The Silex Co.

Coil Winding
Jeffries Transformer Co.

Commutator Dressers
Ideal Commutator Dresser Co.

Compounds, Insulating
Clifton Mfg. Co.
John C. Dolph Co.
General Cable Corp.
General Elec. Co.

Condensers, Electric
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Conduit
Aluminum Co. of America
General Elec. Co.
Triangle Conduit & Cable Co., Inc.
Walker Brothers
Youngstown Sheet & Tube Co.

Conduit, Flexible Metallic
General Elec. Co.
Triangle Conduit & Cable Co., Inc.
Wiremold Co.

Conduit, Underground
Fire Proof Wall Co.
Johns-Manville Corp.
Graybar Electric Co.

Connectors
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Superior Switchboard & Devices Co.
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Westinghouse Elec. & Mfg. Co.

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Wagner Elec. Corp.
Westinghouse Elec. & Mfg. Co.

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General Elec. Co.
B. Hartman

Fittings, Insulator
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Ohio Brass Company

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Pittsburgh Reflector Co.
Smoot-Holman Co.
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General Elec. Co.
Pittsburgh Reflector Co.
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Smoot-Holman Co.
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Wesix Elec. Heater Co.
Westinghouse Elec. & Mfg. Co.

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Edw. L. Wiegand Co.

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See Ammeters, Voltmeters, Wattmeters.

Insulation
American Lava Corp.
General Elec. Co.
Johns-Manville Corp.

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Lamps, Sun
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Weston Elec'l Instrument Corp.

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Maydwell & Hartzell, Inc.
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Locke Insulator Corp.
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Idaho Power Co.
The Montana Power Company
Mountain States Power Co.
Northwestern Electric Co.
Pacific Gas and Electric Co.
Pacific Power & Light Co.
Portland General Electric Co.
Puget Sound Power & Light Co.
San Diego Cons. Gas & Elec. Co.
San Joaquin Light & Power Corp.
Southern California Edison Co., Ltd.
Utah Power & Light Co.
Washington Water Power Co.

Pullers, Slack
A. B. Chance Co.

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New Prices

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L. W. Thompson
Westinghouse Elec. & Mfg. Co.

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Wiremold Co.

Tools, Tree Trimming
Bartlett Mfg. Co.

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General Elec. Co.
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Wagner Electric Corp.
Western Transformer Co.
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Aluminum Co. of America
Youngstown Sheet & Tube Co.

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S. Morgan Smith Co.

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Easy Washing Machine Corp.
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General Elec. Co.
Landers, Frary & Clark
Westinghouse Elec. & Mfg. Co.

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General Elec. Co.
L. A. Nott
Roller-Smith Co.
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
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Crucible Steel Co.
Driver-Harris Co.
General Cable Corp.
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C. E. Ingalls
Keystone Steel & Wire Co.
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The Okonite Company
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Providence Ins. Wire Co.
Rockbestos Products Corp.
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Triangle Conduit & Cable Co., Inc.
United States Steel Corp.
Westinghouse Elec. & Mfg. Co.

Wiring Supplies
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General Elec. Supply Corp.
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Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

ELECTRIC APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

DECEMBER

ALL-ELECTRIC PROMOTION

LOOKING AHEAD we see the entire month of December given over to electric sales promotion . . . first, electrical Christmas gifts; second, light conditioning; third, auxiliary electric heating.

The principal campaign will, of course, be on electrical Christmas gifts which means two newspaper ads plus strong supporting media. These ads will run on the weeks of December 5 and 19.

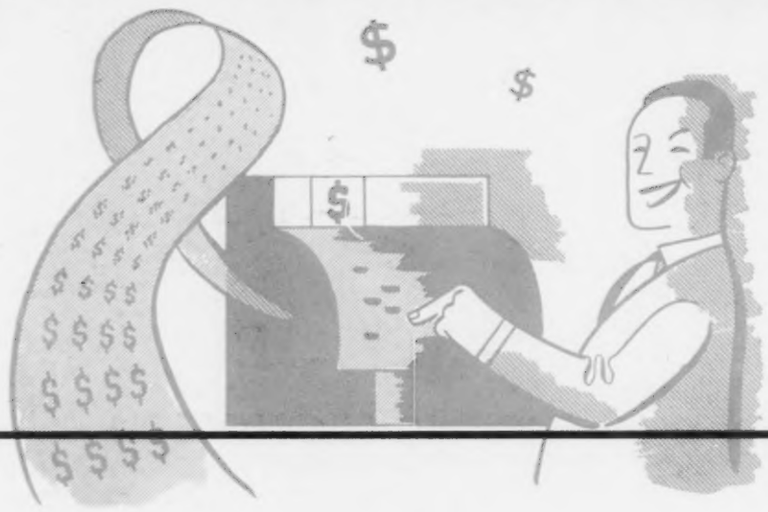
Lighting and portable electric heaters will receive one ad each to run on the weeks of December 5 and 12 respectively.

No doubt our dealer sales promotion representative will get in touch with you regarding these promotions, but in case he doesn't, you have only to phone or write the nearest P. G. and E. office.

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.

EW 111-1138

BE THERE WITH THE HOLIDAY **Punch**



This year of all years, the electrical industry should be there with the holiday punch . . . the kind that puts your whole selling force on its toes, determined to cash in to the utmost on holiday sales.

Some dealers are content to satisfy the normal Christmas demand for electrical gifts. Others go the limit in suggestive selling—in creating attractive displays—in tie-in advertising that pulls prospects to their stores.

National retail trade will show a five billion dollar increase for the last half of 1938 as against the first half. Not in ten years has there been such a swift and buoyant upsurge in consumer demand. Be there this year with the real holiday punch—and watch your profits climb.

Pacific Coast Electrical Bureau

601 WEST 5TH STREET, LOS ANGELES • 447 SUTTER STREET, SAN FRANSISCO